AMERICAN AGRICULTURIST

For the Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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A SUNSHINY RAINY DAY IN MAY.—*Drawn and Engraved for the American Agriculturist.*

There are two classes of rainy days; those of spring and those of autumn. A day of cold rain in November, with the clouds thick and heavy, when all nature is silent in the chill of decay and death, is never welcome, but very sure to come in all its gloom and sadness as the year fades away. There is no life to be seen in the forests or the fields, the joyous birds have either gone to their southern, winter homes, or are hushed and hidden in some secluded nook from the storm that is raging around them. The cattle, sheep, and horses, find comfort only in the warm stable, while the husbandman seeks the warmth of the fireside, and feels glad because he is not obliged to be out in the cold, the wet, and the mud. He is thankful that the season of activity and growth "has filled his barns with plenty, and his home with light and joy."—It is the weather that makes him happy only by the contrast which it brings into his mind: The darkness and gloom of the world without makes him love still more the brightness and the cheerfulness of the home-life within.

A day of rain in May is quite another thing from the driving, shivering storm of late autumn. It is rain, and therefore will wet whoever may be exposed; but it comes more like a benediction than anything else. It is mingled with bursts of sunshine that set all the leaf and flower laden trees aglow, and waters and warms them into a still more vigorous growth. The chickens prefer it to the dry, old coop; the lambs skip and play, as if trying to dodge between the drops. Instead of gloom, it fills the very air with a mingled perfume, and warms the heart with the thought that it comes to bring life into the world.

The artist has given us a picture of a May-day Shower, and to young and old alike, it can but please, and we hope instruct. The children have taken advantage of the rain—a warm, sunny, cheerful shower—and with the family umbrella are making a tour among the bright flowers and happy chicks and lambs.

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Essays on Keeping One Horse.—The report of the committee to which the 93 essays were submitted comes so late that we can only give the bare decisions:

1st Prize to C. F. Burnham, Mt. Holly Springs, Pa.

2d Prize T. L. Nevill, St. John's, Newfoundland.

3d Prize to A. B. Knowlson, Sand Lake, N. J.

One or more of the prize essays will be published as soon as we can find room in our columns.

AMERICAN AGRICULTURIST.

NEW YORK, MAY, 1881.

Suggestions of and for the Season.

No farmer needs to be told that this is a month in which work presses, but many of our readers will find this year that a large share of the work of two months is crowded into one. Over several of the Western States the late and lingering snows have delayed work disastrously, and the ground has not been fit for the plow until long after the usual time. In a season so *unseasonable* as this, in such localities, careful laying out of the work is more than ever necessary. Fortunate are those who prepared the land for spring wheat last fall. In many cases farmers may be compelled to let this crop go by, and give more attention to corn. Early sowing is on many accounts desirable, yet good crops have been made in New York State when the sowing was not done until May 20th. Oats rarely do well unless sown very early. The crop may be much improved by care in preparing the seed. Pass it through a fanning mill to blow out all the light, imperfect seeds.

Corn planting will be the leading work throughout a broad area. It is a matter of common remark with those who observe the weather, that, take one year with another, the first of June will find vegetation about equally advanced, no matter how backward the early part of the season may have been. Corn-land is to be put in readiness as soon as may be, but the seed must not be planted until the soil is warm, and the grain will start into vigorous growth at once. There is often serious loss from planting too early; the grain remains dormant, or rots in the ground. It is often the case that a field planted in April will, in June, be far behind one planted two weeks later. The old rule is: "a sod for corn"; one cannot always follow this; besides in many cases grass land is too valuable as such to be plowed up for another crop. The American farmer is learning that meadows and pastures furnish the most valuable of crops. Corn does admirably on stubble land; the extensive experiments reported to by Prof. Atwater and others, show that it does not matter what the preceding crop has been, so long as the soil is in good tilth, and abundantly supplied with the food elements which the corn plant requires. There is as much difference of opinion as ever, as to whether it is preferable to plant in hills or in drills. Corn can be kept free from weeds with greater ease when planted in hills, as the cultivator or horse-hoe may be run in two directions, and thus leave a much smaller part of the work for the hand-hoe. There is the advantage in drills that the plants are more evenly distributed over the ground, each stalk has more immediate room to itself. A larger crop can be grown with the corn in drills, but it is claimed that, in most cases, this is more than offset by the increased labor in tending it, especially if the land is weedy. The importance of selecting seed corn has been so strongly set forth at the proper season, that it is presumed that this first step towards a successful crop was taken in time. If one has a variety that he has improved by careful selection through several years, he should be slow to change it for a new kind, though we would by no means discourage the testing of new varieties of promise.

The root crop increases in importance, and a greater acreage is devoted to it each year, and it must advance in favor as the country becomes older, and our methods are forced to adapt themselves to the change in our condition. Roots do best in a loose friable soil, with a gravelly subsoil. They require deep culture, and the soil should be plowed to at least ten inches. If the soil is not rich, give a good supply of well-rotted manure; bone-dust, guano, or superphosphate, at the rate of 300 to 500 pounds per acre, may be applied with profit. All such concentrated manures should be sown on the surface, and harrowed in, or otherwise thoroughly mixed with the soil. Mangel-wurzels are the most important root crop. They should be sown by the middle of the month. After mangels come sugar-beets and blood beets, which may be sown early in June, but do the best, usually, when put in the ground the last of May. The leading varieties of yellow-fleshed mangels are: Webb's Yellow Globe, Yellow-fleshed Tankard, and the Long Yellow. The red varieties are less solid. With the fodder crops sown in April, and the corn and roots in May, there is little of the farm land unoccupied. A small portion may be devoted with profit to fodder corn for June, July, or August, after the early rye and clover.

A top-dressing of fine barn-yard manure, or artificial fertilizer applied to the grass land, either pasture or meadow, will often give new life to the grass, and return the expense many fold. Plaster often produces excellent results upon young clover fields. Thus applied, it will help increase the crop to be plowed in as a green manure. One to eight bushels per acre may be sown broadcast, and this should be done as early as possible this month. Do not let the animals go to pasture until the ground is settled and firm.

The Farm Live Stock.

With the hard work of the month the horses require the best care, which includes carding and brushing. Too much corn, fed now, make the animals restless by producing an irritation of the skin. A moderate feed of green rye will be very acceptable to horses, and promote their health. If the land is not stony, the shoes may be removed from the farm teams, for a time at least, with benefit. Oxen being naturally slow in their motions, they will not bear hurrying in their work, and should be given abundant time for feeding. A yoke of oxen can be kept with profit on most farms of considerable size where three or more men with team are employed.

Cows at pasture, as well as those kept in stables under the soiling system, should have an abundance of fresh, pure water, and be properly supplied with salt. This is considered to have a corrective effect upon the succulent food that might otherwise produce some disorder of the digestion. It is best not to let the cows feed entirely upon grass for the first few days, but continue the hay and meal until the green feed is more mature. This caution applies still more strongly to the calves and young stock, which are especially subject to injury from overfeeding with succulent herbage. "Black leg" or "black quarter" in calves is regarded as a result of this. An ounce of Epsom Salts to each calf when turned out is given by some as a precaution against this disease. To change the feed gradually is one of the best methods of

preserving the health of farm animals. Pigs profit by a run at grass. When the trees in the orchard are large enough it should be seeded to clover as a pasture for the pigs. This will afford them good grazing, and at the same time they will destroy many of the orchard vermin. Young pigs will need plenty of good milk, which should be given them separate from the older ones. Ewes from which lambs have been weaned may need to have the milk removed from their udders. If to be fattened they should be fed liberally. When the sheep are shorn, the ticks gather on the lambs, and by dipping them these pests may be destroyed. A number of old and useful Sheep Dips are advertised, or the home-made tobacco dip may be used.... Young chickens will now be coming forward. Those of good breeds hatched this month will begin to lay in the fall, and with care will continue through the winter. The chicken coops need to be moved frequently. There is no better place for young chicks to forage than the vegetable garden; they will destroy many insects. They should have an abundance of fresh water and the coop be set in a dry place. .... The crows are the farmer's friend, but during May they are positively annoying to many from their love of young corn. See treatment of them on page 198.... At odd times, during rainy days, etc., it will be profitable to look over the machinery and utensils used in haying and harvesting, and see what needs to be bought or mended, and thus be in readiness when the clover is to be cut or when the wheat is ripe for the harvest.

Notes on Orchard and Garden Work.

The custom prevails over a large part of the country of making the first of May the "moving day" of the year, and on this account there are many who only come into possession of their garden and other grounds with the beginning of this month. It is late for many operations, but better than not at all, especially if one has made his plans and knows just what is to be done with no loss of time in getting ready to begin. In the Northern States planting in the orchard or garden may be done, late as it is, provided the trees, etc., have been procured and carefully heeled-in, and are ready to plant at once. There is no serious loss in the kitchen garden, save the lack of the earliest vegetables. Therefore those who from necessity must begin the operations in orchard and garden on the first of May should not be discouraged, but go to work with a will and make the most of what is for many things the better part of the growing season which still remains.

Orchard and Nursery.

Grafting is an operation that had better be done too late than too early. The best time is when the buds on the stock are swelling, and if necessary may be continued until the trees are in full bloom. At this season the bark slips readily, and much care will be required when sawing off a limb, not to make a bad wound by peeling down. This can be prevented in great part by cutting through the bark with a strong knife all round the limb where the saw is to go. Buds should be left upon the stock until the union of the graft is insured, which will be known by the buds of the graft starting into growth. After this rub off the buds upon the stock. The growth of the graft will need some attention; should but a single bud start, and push upward very rapidly, a long slender shoot will be produced, easily blown about by the wind and thereby loosened from the stock. All such will require checking by pinching off the top so that lateral branches may be formed. There seems to be a strong desire to give the trees the second place on the land, and put some other crop first. Those who do not care enough for an orchard to devote the land to it, should not plant one. Young trees, not yet in bearing, are not injured by having some hoed crop between them. But when the trees begin to bear a fair crop they deserve and should have all the soil. A clover crop to be fed off by pigs is the best thing for the orchard and for the pigs. This will enrich the soil, as the only thing removed is in the shape of flesh, while a large amount of vegetable matter in clover roots and manure has accumulated.

Insects.—An increase of insect pests will come with the warmer growing weather. The eggs of the Tent Caterpillar will be among the first to produce "worms," which, if left to themselves, will soon begin their ravages upon the foliage. Their coming is easily recognized by their "tents" and these should be destroyed at once. The best time to take them is in early morning before they have left their nests or "tents," when the whole family may be removed and crushed. The bare hand is the best for all within reach; for those upon high branches use a pole with a swab dipped in ley or petroleum. If a newly set tree is found infested with Oyster-shell Bark Lice, it is the shortest way to pull it up and burn it. An old tree with this pest should be painted over with some non-drying oil, as lard oil; crude petroleum has been used with some success. The presence of the Borers is known by the sawdust which they make. The best cure is a knife and a wire or whalebone probe. Cut only enough to allow the entrance of the probe; never girdle the tree as we have seen some do who were hunting for the borers. The Curculio of the plum stings the fruit when it is quite small. Jar the trees when the fruit is set in the early morning, and so long as insects are caught. The sluggish beetles are caught upon sheets spread beneath the trees or arranged with poles to be held by two persons; put the insects into the fire or otherwise destroy them. Plant Lice, that sometimes crowd upon the growing tips of cherry and other fruit trees, can be removed by syringing them with tobacco water; those within reach may be bent down, and dipped in the same liquid.

The Fruit Garden.

It is best to set blackberry and raspberry plants in early spring, but it may still be done. Some means of holding up the growing canes should be provided, either as single stakes or trellises. The canes produced last year bear the fruit, and the new ones are for fruit next year. All suckers at a distance from the rows, unless new plants are desired, should be considered as weeds and cut away. The ground about the currants and gooseberries should be cultivated thoroughly and given a good mulch. The "worms" must be watched for, and upon their first appearance apply White Hellebore, a tablespoonful to a pailful of water. The strawberry bed should be kept free from weeds, and the soil loose and mellow. Before hot weather apply a mulch, which will keep the fruit from the ground and preserve the soil in a moist state. The "White Grub" sometimes makes sad work with the strawberry bed. A wilted plant is an indication that its roots have been eaten off by the pest. Remove the plant and search for the grub before it gets to another plant. Grape vines that have been kept dormant in cool cellars may still be planted. The cost of a few vines is but a trifle and the returns are great. All persons who have ground enough for a garden, however small, have room for at least one grape vine. Newly planted vines should be allowed to grow but a single shoot this year. Tie it to a support. The fruit bearing shoots for this year should have their further growth in length prevented by pinching off the end of the shoot at two or three leaves above the uppermost cluster. The earlier this work is done the better. The baskets and crates should be put in readiness for the fruit. Use the forms established by custom of the market. If square baskets are familiar to the consumers, round ones will be at a disadvantage.

Kitchen and Market Garden.

Many can not begin their kitchen gardening before the first of May, and these will find useful hints in the Notes of previous months. Those who are already well along with their garden work should bear in mind that a single sowing or planting of many of the vegetables is not enough; of those that remain in proper condition but a short time there should be a succession, following the earliest sowings at intervals, that there may be a continuous supply of peas, spinach, radishes, lettuce, etc. Upon these succession crops much of the utility of the garden depends. As stated in the Farm Notes this is the month for planting corn; and "about corn-planting time" means the season when the vegetables in the *tender* class are to go into the open ground, that is, either their seeds are to be sown, or the plants that have been grown under glass, are to be set out. The leading tender vegetables are Beans, Cucumber, Melons, Okra, Pumpkin, Squash, Sweet Corn, and Tomatoes. Plant Beans of the bush sorts in drills 18 inches apart. Among the best early sorts are Valentine and Mohawk; of late years a class known as "Wax Beans" are much liked by many; the Golden Wax is one of the best of the dwarfs, and Giant Wax of the pole sort. Where the season is long enough, the Large Lima leads the list for Pole Beans. The Improved White Spine Cucumber is still mostly grown for the main crop. Green Prolific is the best for pickles. Plants that have been started in cold frames will need to be protected from chilly nights. One of the earliest Musk Melons is the Christiana, yellow-fleshed, but excellent; Ward's Nectar and Surprise, both fine. Hackensack, very large, and when true, very good. The Mountain Sweet and Gipsy are among the best Water Melons; there are other varieties worth a trial. For summer varieties of Squash, plant Summer Crookneck and Yellow Bush; Hubbard and Butman are best for winter use. One of the favorite Tomatoes for general use is the Acme, it being early, prolific, smooth, and solid. The Trophy is also a fine red variety; for yellow, the Golden Trophy is rich and handsome. Mr. Snead Thomas, Marion, Ind., sends a plan of planting ground to melons and cucumbers, which is very simple and satisfactory. The ground is marked out in the usual way for corn. Each

alternate "hill" is planted in each alternate row, the hills planted in one row alternating with those on each side of it. The method is shown in figure 1, where it is seen that each hill is in the center of a circle composed of six other equidistant hills, and thus form what in tree planting is known as "quincunx."

The work with the crops already in will be largely that of weeding, hoeing, and thinning. The Asparagus should be cut with a strong knife and with care. Leave no small shoots to

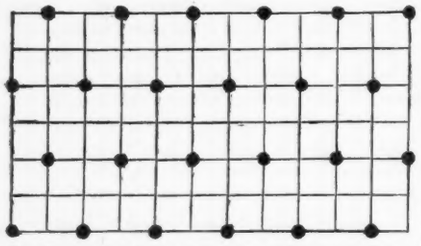


Fig. 1.—THOMAS' METHOD OF PLANTING MELONS.

grow. The early sown Beets will soon be large enough to thin for "greens." Sow the seed of Martynias in hot-beds and remove the plants to the garden when well started, setting them about three feet each way. Keep the Onions, Turnips, Carrots, Parsnips, and other plants in rows free from weeds by a frequent stirring of the soil between the rows, and employ hand-weeding and thinning where needed. Allowing the plants to stand too close is a common mistake.

"W. F.," Southbridge, Mass., sends an improvement upon the fruit-can seed sower, figured in our March Notes. It consists of a movable piece of tin, with holes of different

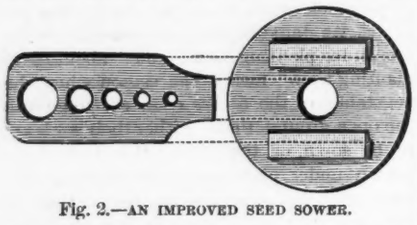


Fig. 2.—AN IMPROVED SEED SOWER.

sizes, which slides between two strips of tin soldered to the bottom of the can. By moving this slide the size of the hole and the amount of seed that can pass through, is easily regulated. The bottom of a can thus arranged for sowing is shown in figure 2.

Flower Garden and Lawn.

It is getting late for starting a lawn, and if the seed is sown now, it is well to mix a small quantity of oats with it, that the oats may shade the young grass from the too great heat of the sun. The lawn mower must be used at least once a week on a well established lawn, and it is well to leave the fine clippings where they fall, to serve as a protection to the grass roots. Any weeds that may spring up, should be removed by the root. Most of them can be readily pulled, but if deeply rooted and the soil is heavy, a chisel upon a long handle will be of service. The greenhouse plants for bedding should not go out until all danger from cool nights is over. If evergreens are to be transplanted, the important point is, to never let the roots get dry; an hour in a drying wind may put a valuable evergreen beyond recovery. The placing of stones around newly planted evergreens has an excellent effect, keeping the ground moist about the roots, and also serving as an anchor to the tree, that might otherwise be moved to its disadvantage by the winds. There are many places where climbers can be grown with advantage. The piazza and other portions of the exterior of the house may be made very attractive with a few Akebias, Loniceras, and here and there a Clematis and Dutchman's Pipe (*Aristolochia*). Unsightly places may be easily screened by a growth of Morning Glories, Thunbergias, and other annual creepers. When the annuals are sown in the beds, care should be taken to preserve the names by using plain labels—a great deal of the interest connected with a variety resides in knowing its name. Lilies, Gladioluses, and other bulbs can go into the open ground now. Provide stakes so soon as any support is needed. Castor Oil Plants (Ricinus) make a peculiar tropical and pleasing appearance in the garden, and can be had with little trouble, or expense, by sowing the seeds. The potted plants that are to stand out-of-doors should have a partly shaded place, and if possible set them upon coal ashes to prevent worms from entering the pots. Shade for the greenhouse plants can be provided by using whitewash upon the sash or by putting up muslin screens. A plenty of fresh air should be admitted, and water given freely. Insects will thrive unless subdued by fumigation, hand-picking, and washing.

What Shall I Do with the Grape Vine?

The *American Agriculturist* is taken by a surprisingly large number who are not farmers, but who live in cities and villages. Many of these follow the custom of moving on May first, and such, as a general thing, find upon their new place one or more neglected grape vines. Each year we receive from such tenants inquiries, asking, in one form or another, "how should a neglected vine be pruned?" We would not advise pruning, as usually understood—the cutting away of the old wood, at this season, as it causes it to "bleed" at a great rate; even if, as some claim, bleeding does not injure the vine, it makes a nuisance that it is desirable to avoid. A vine in a village or city yard may be quite as valuable for its shade as for its fruit—indeed often more so. Such a vine, it is safe to assume, has been sadly neglected, and if it has had any treatment at all, it has been at the hands of some ignorant jobber. To make the best of it, is all that can be done with an old vine, and as each one will be different from every other, we can only give some general rules. Upon an old vine the new growth will usually not only start from the proper places, the buds formed last year, but shoots will "break" anywhere, even upon old wood an inch or more in diameter. When an old vine pushes shoots here and there, it is well to break off such, and as a general thing, allow only those shoots to grow that come from regular buds. As these buds push, they will show embryo clusters, among the unfolding leaves. These minute clusters are not of grapes, as many suppose, but of the buds of the flowers of the vine, which may in time produce grapes. The regular buds, as a general thing, will show three of these little bunches. Examine such a shoot, and there will be found an undeveloped leaf, and opposite to it a cluster of buds; and this arrangement, a leaf with a cluster, will usually be repeated three times (not always), and then, above, on the shoot, will be leaves, with opposite to each, not a cluster, but instead there will be a tendril. All the grapes that the shoot will bear may be seen in this early state. In regular vineyard training, the young shoot is pinched back to the first leaf beyond the last, or uppermost cluster of buds. But, in the hap-hazard treatment that must be followed in the present case, it will be safe to allow more leaves to remain. Go over the vine when the shoots begin to push, and pinch out the end of every shoot, leaving three leaves above the uppermost cluster of buds; this will give all the foliage required for shade, and will allow the fruit to develop much better than if the shoot were allowed to grow at will. If, as is often the case on an old vine, two shoots push close together from one place, by all means break out the weakest of the two. We will endeavor to give the future treatment of such a vine another month. The principal insects that attack the vine at this early season are the little leaf-rolling caterpillar, which will be mainly removed if the pinching of the shoots is done at the proper time.

Extirpating the Osage Orange.

In answer to our request for the methods of those who have had experience in destroying an Osage Orange hedge, a number of replies have been sent, and we give the essential portions of two of the most unlike of these. Mr. D. B. Paine, Christian Co., Ill., had a hedge about 20 rods long, and some 17 years old. Finding the necessary care in trimming, etc., more than he was willing to give to it, he concluded to remove it and replace it by a picket fence. In December, 1877, he, with a hired man, went at the job, Mr. P. pushing the plants over with a long-handled fork, while the man cut them off with an axe at two or three inches below the surface of the ground. A picket fence was then built along the line of the hedge, and care was taken to leave the stubs of the Osage plants exposed as much as possible. The ground was frozen throughout the winter; in spring, to his surprise, but few shoots appeared from the roots; the few that started were allowed to get 12 to 18 inches high, when with a spade the root was dug out and cut off below the sprout. This ended the Osage Orange fence, of which Mr. P. says: "I want no more." .... Mr. J. Teachie, Baltimore Co., Md., having to destroy a hedge that had been established 25 years, began the work in spring. The plants, which at this age had trunks as large as fair sized trees, were cut off as close as possible to the surface of the ground. In the driest part of summer, every root that could be seen was grubbed out, and the land put in shape. When the autumn rains came only two or three shoots appeared, and these were extirpated, and none sprung up thereafter. From these accounts there does not appear to be any special difficulties in getting rid of the old Osage Orange hedge plants.

Bone Meal.—The value of bone meal depends largely upon the amount of phosphoric acid it contains. In bone this acid is in combination with lime as phosphate of lime, and makes up nearly one half by weight of raw bone. The other constituents are water, fat, and animal matters, with about four per cent of carbonate of lime. The action of bone as a fertilizer, whether quick or slow, depends upon its fineness. If ground

very fine the response is rapid, otherwise bone will be slow in its action, though its effects may be felt for years after its application.

"Electricity" Nonsense and Humbug.

The aggregate amount of imposition, petty swindling, and larger humbuggery, now practised, based upon "electricity," "magnetism," "galvanism," etc., is incredible to any one who has not watched the general newspaper advertising, and collected an assortment of a class of circulars now being daily distributed throughout the country by the ton, in the mails, from drug stores, shops, and in various other ways. There are now heralded electric or magnetic or galvanic bands, batteries, belts and brushes, pills, potions and lotions, in infinite form and variety; while "electrical doctors" rival Egyptian frogs in number. As the enormous expense of all the above is kept up continuously, there must be an immense number of people gulled into paying the tax on their credulity—often at the sacrifice of the comforts and even necessities of daily life.

There is some satisfaction in the fact that most of these mechanical contrivances sold, are in themselves positively inert and useless, and therefore not injurious; while imaginatively sick people, and others with slight nervous disorders, are soothed and comforted, and sometimes actually cured through their belief in the efficacy of the otherwise useless nostrums.—Take an illustration: We know a person in good position, of more than ordinary intelligence on most other subjects, who positively believes himself benefited by a large horse-chestnut always carried in his pocket! To lose this, and be unable to get another, would give him the blues, if not bring on a spell of actual sickness. Another person, of like intelligence, has equal faith in a combination of copper and zinc, the size of a silver dollar, worn suspended from the neck, and called an "electric battery," though having no more eletrical or galvanic or magnetic effect than so much silver, iron, stone, or wood—that is, no effect at all, save upon the imagination.

There are now half a score or more varieties and forms of the wonderfully be-puffed and advertised electric things, all equally nonsensical and intrinsically useless so far as electrical or magnetic or galvanic effect is concerned. A hair-brush—costing 50 cents to $2, according to the quality of bristles and handle, if applied briskly to the head may, and often will, have a soothing effect, and sometimes relieve pain on the principle of "counter-irritation," as noted last month (page 159). The effect may be heightened if the user can only be persuaded that there is some electrical or magnetic effect. This can easily be done, with those not skilled in the science of electricity. Conceal in the handle or back of the brush a slender steel magnet (or even a bit of iron or steel), and when the brush is brought near a small pocket compass, the concealed metal will disturb the needle, just as a pocket-knife, or scissors, or a nail will attract and move the needle of any compass. For appearance sake fine wire may be mingled with or substituted for part of the bristles, though any wire in a brush, however fine, we consider too harsh for use upon the delicate cuticle that ought to always exist upon the human head. It may do for the skin of a rhinoceros, or the tough hide of some domestic animals.

While we dislike to see an extra price paid for even a good hair brush, or for a small piece of combined metals, under a delusion as to their having any magnetic or galvanic or electric utility, the loss seldom amounts to more than a dollar or two per individual. This is partly offset by the fact that some people are benefited through their imagination. And then, again, the enormous sums expended in advertising people into this faith, help support several otherwise good religious papers, to say nothing of good political ones.

With respect to the electric, magnetic, or galvanic pills, potions, or medicines, and the more expensive actual electric batteries, the case is different. While the electric or magnetic claims are sheer nonsense or worse, we can not too often warn all readers, that no one is ever justified or safe in using *any* active medicines of which he (or his physician) does not know the composition or effects, and that in his case the effects will be useful instead of deleterious. To experiment here is dangerous. That "What is one man's meat is another's poison," is always true of any active medicine. It may have happened to be useful to a person at one time, and yet be strongly injurious at another time—even dangerous! No one unacquainted with the composition of a medicine, the particular action of its ingredients, and his own exact complaint and condition *at the time*, is safe in using any active remedy except under the direction of a trustworthy, known physician, skilled in such matters.

On this account, we deprecate all popular use of the publicly offered remedies and appliances, and reject from our columns all advertisements of them, though, as they yield an enormous profit, the sellers can and do pay large advertising bills, and though the income from these, if admitted to our columns, would enable us to furnish the paper at lower subscription rates.

Galvanic electricity is set in motion by chemical action, and magnetic electricity by the motion of permanent magnets in a manner to have opposite poles pass each other with great rapidity. Either chemical or mechanical action, kept up, is necessary to the continuous development of electricity. This electricity may, by proper arrangement, be passed through the entire system, or any portion of it, and it may be useful in certain cases, or it may have a directly opposite effect. Only an intelligent physician, on the spot to examine the patient, and apply the electricity in the proper manner, can decide as to its probable usefulness or injury.

The entire class of fixed combinations of metals of whatever kind; whether offered by Boyd, Elias, or any one else; whether called "electric," "galvanic," or "magnetic;" whether of American or foreign origin; whether large or small; whether round or oblong, or any other shape; whether ornamented with embossed figures of devils or angels, with the flames of Hades or the lightnings of heaven—are all, in reality, just as useful "electrically," "magnetically," or "galvanically," as so much plain copper or lead, or zinc, or silver—except as they operate upon one's faith through the preposterous claims put forth for them in the enterprising sellers' advertisements. This faith is so strong in many people, that it is even safe for the dealers to promise to "return the money," if the purchaser does not find benefit—albeit it is easier in most cases to pay money than to get it back for "guaranteed" medicines and the like. The man who has got your money by ingenuity will be ingenious enough to worry you out with pretenses that "it was not used according to directions," or some other subterfuge.

How Early Gardening Paid.

An incident never put in print, may afford a useful hint to many. While travelling through Eastern Iowa several years ago, we were taking lunch at a railway restaurant, when a man rushed up, saying he had heard of our passing, by a telegram the conductor had sent ahead, and urged our stopping over night to see his place, and give a talk to the farmers of the neighborhood. On being assured that an engagement in Illinois would prevent it, he fairly pulled us out on to the platform, and pointing to a fine place on an elevated location, with excellent buildings, etc., said, "your *American Agriculturist* gave me that splendid farm and home." A little startled at this, we had barely time to get a brief explanation before the train started, and even forgot to ask his name. It was as follows:

"Several years ago, you wrote that if any enterprising man living in the vicinity of a large village, or of two or three smaller ones, would manage to put his early peas, corn, beets, cucumbers, etc., etc., into market a week or two ahead of others, he could get two or three prices for the first offerings. That this could be done by selecting a warm, dry plot, by draining it well if needed, by putting in seed very early, and protecting with straw or other covering when cold nights or frosts threatened, after the plants were up. And especially by the following plan: Have prepared a lot of pieces of sod, a foot square or so, if pretty well rotted and free from fresh grass roots, all the better, but not essential; moisten them with weakish liquid manure from the barn-yard. Into this, marked off into little squares of the size required by different plants, put peas, corn, etc., etc., one seed in a square. Place several rows of these sods along the south side of a board fence. Keep them sufficiently moist to sprout the seeds, and start the growth, using larger pieces for potatoes. In cold nights, cover with coarse cotton cloth, which may afterwards be bleached and cut up for family use; or have straw at hand to throw over when needed. When the warm, settled weather arrives, and the ground is all ready, with plenty of well-rotted manure worked in, cut the sods into squares, so that each piece will have a plant in it with two or three weeks of growth already made. Put these pieces in the ground at proper distances; plants go right on with their growth, and thus much time may be gained in the maturity."

"I acted upon this advice, extending the operation largely; had my sods prepared in autumn, and well frozen in winter, and on a small area got seed enough started thus to plant over two acres. My early garden stuff was the town talk, brought in a heap of money, and in this way I was able to pay for that land, and get forehanded enough to put up those buildings, and I don't owe a cent. That's the way your paper gave me all you see up yonder"—and the moving train cut off the narrative—the last words we heard sounding like this: "I have competitors now, but I have enough else to do, and don't need to do so much with the early stuff."

Bee Notes for May.

BY L. C. ROOT.

The season is now at hand when prompt action must be taken to secure a large force of bees to gather the honey as the season advances. If colonies are in proper condition at this season, brood rearing will progress very rapidly. The requirements are: a properly arranged movable comb hive, clean, straight worker combs, a fair quantity of bees, the necessary food with which brood-rearing may be carried on, and, most important of all, a good prolific queen. As our Notes are particularly for the benefit of the beginner, I will speak of some of the common hindrances to progress. The inexperienced often fail to observe the difference between worker and drone combs, and the consequence is that a large proportion of the comb, and that often in the very center of the hive, will be drone. After a little experience, the difference may be observed, and such combs removed, or at least placed at the outside of the brood nest, where they will not occupy space that properly belongs to the workers. The advantages to be gained by the use of Artificial Comb Foundation in securing straight worker combs, are worthy of investigation. The worker cells are about one-fifth smaller than drone cells. Figure 1 shows a piece of comb which consists of worker cells at the left, and drone cells at the right and upper side. A study of this engraving will aid in determining the kinds of comb. The different kinds of bees are also shown in the same engraving, very true to nature. As it is very essential to know that the queen is present in the hive at this season, her appearance, and the attention shown her in the engraving, may aid in recognizing her. If the inexperienced are unable to make out the queen, her presence may often be ascertained by finding eggs or brood. If eggs are found, the queen must have been in the hive within at least four or five days. The eggs and larvæ in different stages are shown in figure 2, somewhat magnified. The absence of a queen may often be determined by finding queen cells that have been started. Bees will sometimes start these cells when the queen is unprolific, before they destroy her. Queen cells in different stages are shown at *a*, *b*, *c*, and *d* in figure 3.

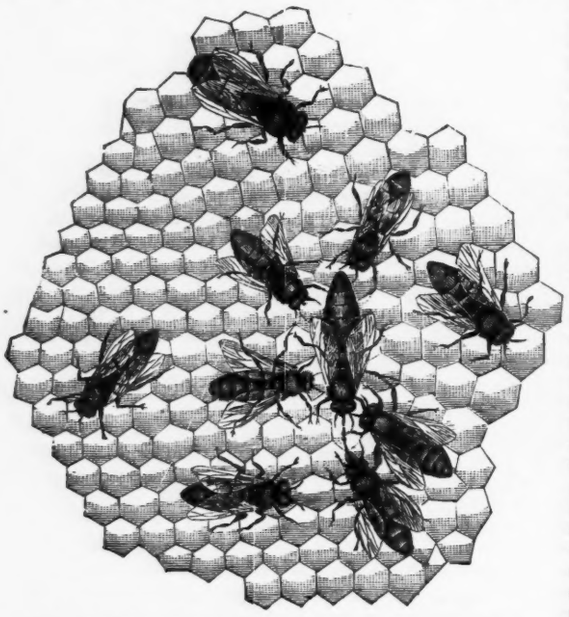


Fig. 1.—PIECE OF COMB WITH WORKERS AND DRONE CELLS.

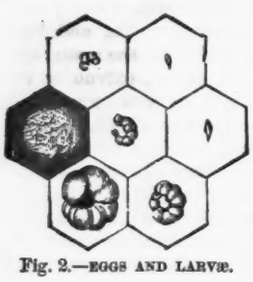


Fig. 2.—EGGS AND LARVÆ.

After other necessary things are provided, the next important object is to secure sufficient stores. While there are advantages to be gained by supplying a proper amount of liquid food, I am of the opinion that the average beginner will do best to avoid feeding it, if each hive has a good supply of sealed stores, but the essential point is not to allow them to consume all of their stores and thus interrupt proper brood rearing. During the past winter bees have consumed more than the usual amount of honey, and the consequence will be that great care will be necessary in furnishing food before the supply is exhausted.

TRANSFERRING BEES.—This is the proper time at which to transfer swarms from the common box-hives to those with movable combs. In the space given me here I can only briefly call attention to the different operations necessary to be performed. Those who are interested in the proper care of bees, and desire to proceed with a view to such results as are attained by the best methods, must secure a practical work where all the different methods are minutely described and illustrated. Such works are prepared with great care, with a view to those wants, and will be found invaluable. [We may here add that "Quinby's New Beekeeping," contains the most complete directions for this and all else relating to apiary management. See Book List.—ED.]

KINGBIRDS AND BEES.—"B. H.," of Iowa, asks for my views as to whether Kingbirds kill bees.... Unquestionably they do kill some bees. Some feel justified in killing the birds when they see them in the act. I do not feel disposed to advise so doing.

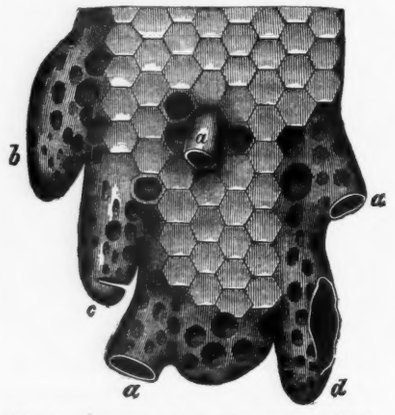


Fig. 3.—QUEEN CELLS IN DIFFERENT STAGES.

Spring Rye.—We are asked if there is a distinct variety known as "Spring Rye." That a grain is sometimes sown in the spring under the name of Spring Rye, we are well aware. Whether it is in any respect different from the grain that is sown in the fall we can not assert. With wheat, the habit of growing and maturing a crop when sown in the spring, may be fixed upon the winter varieties in a few seasons of spring sowing. Whether any one has done this with rye we are not informed. It is worthy of note that rye, of all our cereals, is the least affected by cultivation; we have numerous and often well marked varieties of all the others, but rye remains through centuries of cultivation, one and the same. If rye refuses to deviate from the original type—will not "break" like other grains, into varieties, it will reward experiment in one direction—that of increasing the yield. A series of selections of only the largest and heaviest heads, for seed and a continuous sowing from such for a few years, will no doubt show a marked increase in the yield of the crop.

Sundry Humbugs.

Several of our letters show that some of our newer readers do not understand the principles upon which this column is conducted. We are obliged to state each year that it is not enough for one to write a request that we "show up 'So and So' as a fraud;" and that unless documentary evidence accompanies it, such a letter may as well remain unwritten. We have but one object in view in making an exposure of humbugs of any kind—namely, to protect our readers and others from fraudulent and doubtful schemes of every kind. It is of little use for one to give it as his "opinion" that a scheme is a swindle and a person is a swindler. We must have proof, thoroughly convincing proof. Those who operate upon the agricultural community take advantage of this season, when the farmer is driven by the press of spring work, to present their schemes. We say to every farmer, either take time to examine whatever new or promising thing may be presented, or say "No" at once. Now is the time when the chap with the Mowing-Machine Knife-Grinder will be around. He will wish to leave a dozen to be sold to the neighbors, at a good profit. You are not to pay until the things are sold, and are merely to sign a receipt for the Grinders, that the vender may show what he has done with his stock.

Don't Sign It! Don't Sign Anything!

Three quarters of all the trouble that farmers have with the swindlers who go about the country, comes from signing something. Do not sign *any kind* of an agreement; do not sign a receipt of any kind; do not even write down your post office address, for any travelling stranger. The chances are, that the signature will turn up at the bottom of a note which in due time will make its appearance for payment.

Travelling Venders for Fertilizers

are to be avoided, no matter what claims they may make for the stuff they offer. A fertilizer is one of those things, the value of which rests upon the good faith of the maker; the farmer cannot know beforehand whether it be good or bad. If one needs a fertilizer, let him look over our advertising columns, and order of whichever maker or dealer seems most advisable. To purchase of an unknown person is money thrown away....While we are well aware that our warnings against frauds and dangerous articles are useful, it is not often that we have such direct evidence as now comes from North Carolina. A correspondent in Randolph Co., writes that an agent came along with

"The Celebrated French Illuminating Fluid,"

he showed the agent our warning against the stuff, in the February Number, whereupon the "agent stopped selling," but more than that, "he became a subscriber to the *American Agriculturist!*".....The circular of instructions to agents as to the introduction of this oil and the "Excelsior Burner" for using it, form a most curious document. The "Excelsior" is one in which a very volatile liquid is converted into vapor by the heat of the heavy metallic burner, and the vapor, as it passes out of several holes, burns with great brilliancy and has every appearance of gas. The circular asserts that it is *gas:* but it is only vapor, and while the *burner* may be safe from accident, the danger remains in requiring the use of one of the light petroleum products. No matter by what name it may be called, whether Naphtha, Benzine, Benzoline, Gasoline, or other name—the article itself should *never be tolerated* in the house, and never used with any kind of burner whatever....Not long ago there were parties in New York anxious to introduce

The "United States Washing Machine"

which, on condition that the recipient would promise to show the same "to any ten of your lady

friends," would be sent for 75 cents, which was merely to cover cost of packing and charges. We figured the "Machine" in April of last year, showing it to be a gimcrack that could not cost 15 cents. But the "United States Washing Machine" now hails from Boston, and what appears to be essentially the same card as that sent out by Lynn, Sisson, and the rest, comes now from Jones. But Washing Machines seem to be declining, the price having gone down to 60c., though it must be, as before, shown to not less than "ten lady friends." ....When the Lottery business first went to New Brunswick, it was a "Soiree," but it is now a

"Cash Distribution,"

and by the tone of its circulars we infer that business is dull. They quote papers in praise of the honesty of the management, but conveniently omit to say where the papers are published....The old story of offering

Counterfeit Money, or "Queer,"

turns up with a new version; not long ago it was offered as "cigars;" the latest dodge is to call it "U. S. Chromos" and at the low price of $15 per 100. The game is such a very ancient one, and has often been exposed so thoroughly all over the country, that we wonder that those engaged in it can get enough to pay for circulars and postage.... There are chaps in two or three small New England towns engaged in a dangerous business. They

Sell Books by Samples,

because persons "have been deceived a great many times as to the nature of the books, by sending for books that they thought were good, by the high sounding titles, and paying a high price for a book that was not what they wanted."—This concern proposes to send books as "samples" C. O. D., and a beautiful set of books it is; we can not with propriety even give the titles of the stuff they offer to send out. No names appear on the circulars, etc., and we do not wonder. The rascals show that they have some sense of shame left, by hiding themselves behind the title of

"The Sample Company,"

and it is an ex-sample of a very mean company. These chaps, and all like them, do their business exclusively by mail, and lend emphasis to our former caution to parents, to be sure and know what matter their children receive through the post office.... Various concerns advertise from N. Y. City, making attractive offers of books and of music, to be sent by mail on receipt of the money, at prices which seem to be astonishingly low. The latest case gave its number only a block away from our present location. One of our most careful associates failed to find the music man or any one who knew him. As the building is one where there are many offices, we have no doubt that this advertiser has his times to meet the letter carrier somewhere in the building and thus get his letters. How the music goes out remains to be discovered.

Remedies for Deafness.

One who is wholly or only partially deaf, is deprived of a great deal of enjoyment, and will naturally catch at anything that offers a relief. Some of the appliances, as the various '*phones*, are not humbugs in themselves, because in some cases they are really useful, but these cases, we are frankly told by a dealer, are about one in twenty. Another set of proposed remedies are the

"Artificial Ear-Drums."

Several of these are offered, each claiming to be the original. These appliances are, all that we have seen of them, a bit of sheet rubber, about as large as a silver five cent piece, attached by the center to a piece of small wire about an inch and a half long. Such a contrivance as this, which could not cost 5 cents, but is sold for several dollars, might at first sight be set down as utterly worthless; but we have the testimony of one of the most eminent aurists that it is not always so. That there are cases of deafness in which such a trivial thing as this placed in the ear will greatly relieve deafness. That the bit of rubber can act as an ear-drum, is impossible, but it has been found that in some cases a wad of cotton or lint, or even of soft paper when placed in the outer ear, will aid the hearing, and in such cases this rubber "ear-drum" is just as good as a lock of cotton—and not more so! The venders of this "ear-drum" can get genuine certificates from those who have worn them that the thing has been useful in their cases. The humbug consists in calling the thing an "ear-drum," and charging a high price for it. We are assured by the highest authority that a bit of cotton will do all that such a thing can effect....Some of our letters, though from entire strangers, are often quite touching, especially those from persons with an incurable disease, like consumption, and who

Catch at every Promise of Cure.

Physicians are aware that the hopefulness of the patient is a marked characteristic of the consumptive, who never gives up hope so long as life lasts. The quack medicine chaps know and act upon this, and their advertisements are framed to meet this characteristic of consumptive patients, who, long after the physician has pronounced them beyond cure, will continue to try every compound advertised to meet their cases. One in inclosing an advertisement which offers to send some of the "positive remedy" free, writes: "If good, it must be very good, but if a fraud it is a very bad one, but seeing it in such a paper as the —— and the ——," he could not help noticing it, and asks our opinion. Our opinion is, that one who sends for and takes the stuff will probably feel so much better that he will send for more and pay for it, as it will be some tonic or stimulant that will make the consumptive feel really better for awhile, or until the reaction comes. So far as our experience goes, and it has been rather extended, all of these consumptive cures are bodily stimulants accompanied by a treatise to act as a stimulant to the imagination..... Scarcely less reprehensible are those so-called

"Restorative Remedies,"

which profess to cure the "diseases of error," the results of "youthful indiscretion." Those who know anything of the subject, are aware that the imagination is morbidly active concerning all that relates to the generative function. Hence the circulars of medicines professing to treat this, not only act by means of portraits of the victims of "youthful indiscretion," but in the description of the symptoms of the disease, include every possible ache and pain to which any one may be subject, and act upon the imagination to that degree that the patient is ready to welcome the stuff as the only escape from a premature grave. Unlike Inman, I. T., whose "free recipe" calls for things unknown to any apothecary, a circular at hand prescribes well known and powerful remedies, but for preparing them, gives directions which are absurd and impossible to follow. Of course, this difficulty has been foreseen, and the advertiser will kindly furnish the stuff ready made at a good round price. ....We had supposed that our "opinion" concerning all

Advertising Physicians and "Institutes"

was sufficiently well known, but from a far-away corner in British Columbia, there comes a letter with two advertisements cut from American papers, asking the "standing of these men." We might answer—"Standing, they haven't any." That any one should ask what is the "standing" of a "Dr." Willis, is quite beyond our comprehension. Any one who proposes to prescribe for the sick as this Willis does, by an examination of the patient's hair and hand-writing, is out of place just now; he should have been around several centuries ago. The "Institute" at Boston is probably like other "Institutes" and "Universities" in New York and elsewhere, a concern of one-man power. The "Institute's" advertisement concludes with "Heal Thyself" in large letters, which is very good advice for our friend to follow, so far as it induces him to let the "Institute" very severely alone."

Is Rhubarb Poisonous?—Every now and then there appears an item to the effect that tomatoes contain an acid injurious to the teeth, or that rhubarb owes its acidity to oxalic acid, and is consequently poisonous. So far as rhubarb goes, the use of it as a welcome substitute for fruits is yearly increasing. The sourness of Rhubarb stalks is due to Malic Acid (the acid of apples) and to Citric Acid (found in lemons), both of which are as healthful as they are agreeable.

A Halter for a Pulling Horse.

Mr. Alexender Kossman, Columbia Co., N. Y., writes: "The improvement in the halter to prevent horses from pulling, shown in the March number, is a very good one, but a still better form can be made by using a small chain to pass over the nose instead of a strap." The throat strap, as shown in the accompanying engraving, made from Mr. K's. sketch, passes in a loop through a ring, and carries a ring, to which the halter strap is fastened. For a horse that is headstrong, and inclined to pull upon the halter, this form is especially useful.

IMPROVED HALTER.

The U. S. Pomological Society.

The receipt of the volume of Proceedings for the Session of 1879, reminds us that the present is the year for the biennial meeting of this important Society. The late appearance of the volume is due to the fact that Mr. Robert Manning was engaged on other work, as he informed the Society when it actually forced the Secretaryship upon him. The volume is more portly than any of its predecessors, and it is of course more valuable, as, aside from other matters, it records, in the revised catalogues, the latest experience of the members with the various fruits. The proceedings and discussions at the meetings are given, preceded by the address of the President, prepared by Col. Wilder while yet suffering from the accident which prevented him from attending the meeting. The reports of the several committees and the essays presented at the meetings make up the bulk of the volume, which bears throughout evidences of the careful work of the Secretary.

It is not too early to give conspicuous notice to the members and to all other fruit growers that the meeting will be held this year at Boston, Sept. 14th. The Society is a National one, and welcomes every one interested in fruit culture, whether as an occupation or an amusement. The biennial fee is $4, which entitles the member to the Proceedings; Life Membership, $20. No fruit grower should stay away because he is not yet a member, but should go to the meeting, and become one. Those who have attended a former meeting at Boston will not need any persuasion to go again; to those who have not, we may say that Boston may be regarded as the chief center of horticulture in the country, and there is probably no place, in which, and its surroundings, is so much to be seen and learned by one interested in any department of horticulture as here. Besides this, it is the home of the venerable President, to whom a full attendance on this occasion will be especially gratifying, and it would be a graceful tribute to his long and devoted services to make the coming meeting the largest and most successful that the Society has ever held.

Threshing Machines and Separators.—"The Vibrator."

The Cotton-gin is often cited as the great contribution of invention to agriculture; important as it is, we have but to imagine the acres of last year's wheat waiting to be

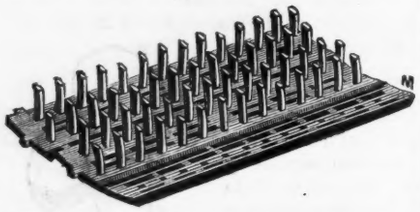


Fig. 1.—THE TOOTHED AND BLANK CONCAVES.

threshed by the flail, to see in the Threshing Machine, an invention at least quite as valuable. Good judges have estimated that the gain in the saving of grain by the use of the machine, instead of the flail, amounts to five per cent of the whole crop; but no one, so far as we are aware, has told us what proportion of the crop is still wasted by imperfect machines and their hurried and careless working. The wheat-grower can not know whether his crop has been a profitable one or not, until the grain is measured. When his grain is harvested and in sheaves, it is not beyond all danger of loss, for it still has to run the chances of the Threshing Machine. That there is a loss, every one who has watched the operations of the machines that go about the country is aware. The average gang of threshers seem to regard quick work as more the object than thorough work, and appear to forget that separating is quite as important as threshing. It is claimed that there is a great difference in machines in respect to waste, and whoever is about to purchase a machine, whether for his own use, or to do threshing for others, should regard the completeness with which it does the work of separating and saving the grain as the first point to be considered. Among the threshing machines claimed by the makers to present marked improvements in this respect, is "The Vibrator," which, in a new style of Separator, and other points to secure simplicity and effectiveness, is so different from the old style of machines, as to make it, they claim, the type of a new class of threshers. The essential parts of a threshing machine, of any kind, are, first: the Cylinder, the spikes or teeth on which, opposed to other teeth in the Concave, beat the grain from the heads—the

Fig. 2.—THE UPPER SHAKER OF SEPARATOR.

thresher proper, and second, the Separator or arrangement to separate the grain from the straw and chaff. Of course there are various accessories, but these are the parts chiefly engaged in doing the work, and which, it is

Fig. 3.—THE SEPARATOR.

claimed, are, in "The Vibrator," greatly improved. The grain, just as it enters the machine, meets the first of these improvements in the Concaves and their arrangement. There are, as in figure 1, two Concaves, each with two rows of teeth and a Blank Concave, or grate, marked *M*, which may be placed either at the front of the two Concaves (as in fig. 1), between them, or at the rear. This arrangement is regarded as a most important feature, and is claimed to be peculiar to this machine. The changes are made to suit the different conditions of the grain, and to adapt the working to various kinds of grain and seed. Placing the Blank Concave in *front*, as in the engraving, causes the machine to draw in the grain faster. On the other hand, if the Blank be placed at the rear, the grain is taken in much slower, and this position is used when the straw is unusually long and limber, or otherwise in bad condition, as it prevents the straw from winding around the cylinder. The usual position, in ordinary conditions of grain, is, with the Blank between the two Concaves. For very fine seeds, such as Timothy, the Blank is not used, but a third toothed Concave is put in its place. The most complicated portion of threshing machines is usually that which separates the grain and straw after they leave the Cylinder and Concave. The makers of "The Vibrator" present a strong claim for the greater simplicity of their machine in this respect, and forcibly illustrate it, by publishing in their pamphlet, an engraving showing the parts found in some other machines, and not in theirs; this miscellaneous collection of endless aprons, raddles, beaters, cog-wheels, rollers, bands, shafts, and other parts, is exhibited in striking contrast with their own very simple Separator. This (figs. 2 and 3), consists of two shakers, suspended one above the other, and vibrate in opposite directions. The mixed straw and grain passes from the Cylinder to the upper shaker, fig. 2, where it meets with the sets of fingers there seen; these alternately rise and fall, giving the straw a tossing, with much the same effect as if it were taken up in forkfuls and shaken, causing the complete separation of the grain, which falls through to the lower shaker, whence it passes to the sieves. These, the Concaves and the vibrating Separator, are claimed as the leading distinguishing features of this machine. The general external appearance of "The Vibrator" is given in fig. 4; it includes a number of improvements of less importance, such as the arrangement of the stacker, methods of adjusting the concaves, the cylinder cover, a belt-tightener, an improved side-gear, etc., all of which are fully illustrated in a handsome pamphlet, issued by Messrs. Nichols, Shepard & Co. Abundant testimony is given as to the effective work done by this machine, not only with wheat and other cereals, but with the various grass and other seeds. The makers claim that their machine is the only one which threshes flax with as much ease as it does grain, flax being the most troublesome of all plants to thresh. As flax culture is likely to take a new start in this country, every improvement that tends to facilitate the utilizing of the crop is especially welcome. We may add that the makers of "The Vibrator" manufacture improved Horse-powers for driving it, as well as Steam Engines. In many wheat-growing localities, straw is at present looked upon as a nuisance; where wood or other fuel is scarce and straw is in excess, the engine made by the firm, under the boiler of which straw may be used as fuel, will no doubt be gladly welcomed.

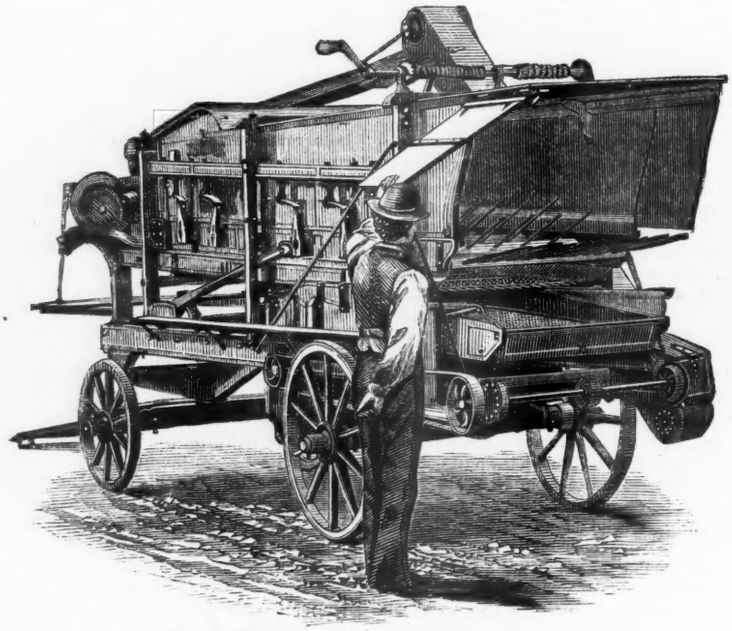


Fig. 4.—"THE VIBRATOR" THRESHING MACHINE.

"Some One will Eat the Fruit."—Some years ago the writer dined in May with a well known General of the Army whose duties then required him to live in New York City. It was with no little pride that he took us to his back yard, probably 25 by 30 feet, where he had set out various shrubs and hardy plants, and against the fence were several newly planted grape vines. "But," we said, "you do not expect to live here long enough to see the fruit of these vines."—"Of course not," said he, "but there are the vines and some one will eat the fruit. I make it a rule, wherever I may be stationed, to plant one or more vines." If every one would do

thus, and plant vines, whether they will see the fruit or not, the average amount of human comfort would be greatly increased.

What Trees to Plant for Fuel and Timber.

The attention of our people in the older States is being very properly turned to planting rocky ridges and worn out pastures with forest trees. This work is done by those who have no expectation of cutting the timber themselves, but with a view to improve their property for future sale, or for their heirs. These old pastures now are worth $10, or less, per acre. Forty or fifty years hence, covered with heavy timber, they would be worth $300, or more, per acre. Two elements may safely enter into this calculation of the profit of tree planting: the steady growth of the trees, and the constant increase in the price of fuel and timber. There is great difference in the price of the varieties of wood, but still more in the rapidity of their growth. Hickory grows more rapidly than White Oak, and in most markets is worth a quarter more for fuel. Chestnut grows about three times as fast as the White Oak, and for many purposes makes quite as good timber. It is in great demand by ship-builders, and cabinet-makers. The Chestnut, the Tulip Tree, and the Hickory, attain a good size for timber in 20 to 25 years, and the Spruce and Pine want about 50 years. The Maples grow quite rapidly, and are highly prized, both for fuel and for cabinet purposes. On light sandy land, the White Pine will grow rapidly, and cannot fail to be a good investment for the next generation. As a rule the more rapid growing trees, if the wood is valuable, will pay better than the Oaks. C.

Science Applied to Farming—LXIX.

General Results of the Farm Experiments.

Some of the more important results of three years' consecutive experiments, of which averages are given in the accompanying table, are briefly summarized as follows:

1.—As the experiments were largely on worn out soils, the average produce with a given crop does not represent what might be expected under fair conditions.

2.—The largest yield came with the "complete" Chemical Fertilizer (*G*), which supplies 150 lbs. of Nitrate of Soda, 300 lbs. of Superphosphate, and 150 to 200 lbs. of Muriate of Potash, at a cost of a little over $15 per acre. I would not propose just these proportions for general use, however. Less Potash and more Nitrogen would generally be better for some crops, as grain, potatoes and garden vegetables. The object here was to test soils, and not to get the largest possible yields.

3.—The next largest average yield is with the farm manures. Then follows the mixture of Superphosphate and Muriate of Potash (*F*). This latter averaged most profitable of all for corn.

4.—Next came the mixture of Nitrate of Soda and Superphosphate (*E*). That this, which contained Superphosphate and Nitrate of Soda should bring a lower average yield than the mixture of Superphosphate and Potash Salt with every crop on which the number of trials is large enough to warrant any general conclusions, is certainly a significant fact. Our ordinary Guanos, Ammoniated Superphosphates, and Fish Manures, contain (like *E*), Nitrogen and Phosphoric Acid with little or no Potash. Nitrogen is the costliest, and Potash one of the cheaper of the valuable ingredients of ordinary fertilizers. Another season's experience thus emphasizes our last year's statement, that manufacturers and users of Ammoniated Superphosphate would do well to consider the substitution of Potash Salts for nitrogenous materials in their fertilizers.

5.—These experiments explain very clearly why Guano, Fish, Bone, Superphosphates, etc., so often fail. In many cases the trouble is a lack of Potash.

Averages of Results of Experiments of 1878, 1879, and 1880.

Produce, Increase, and Gain or Loss per acre, with different Fertilizers and Crops.

NUMBER OF FERTILIZER...	0	A	B	C	D	E	F	G	H	P. M.
FERTILIZERS PER ACRE.	No Manure.	Nitrate of Soda, 200 lbs.	Dissolved Bone Black, 800 lbs.	Muriate of Potash, 200 lbs.	Nitrate of Soda, 150 lbs. Dissolved Bone Black, 800 lbs.	Nitrate of Soda, 150 lbs. Muriate of Potash, 300 lbs.	Dis'd. Bone Black, 800 lbs. Muriate of Potash, 300 lbs.	Nitrate of Soda, 150 lbs. Dis'd. Bone Black, 800 lbs. Muriate of Potash, 200 lbs.†	Plaster, 200 lbs.	Farm Manures.
VALUABLE INGREDIENTS PER ACRE.		Nitrogen, 32 lbs.	Phos. Acid, 48 lbs.	Potash, 100 lbs.	Nitrogen, 24 lbs. Phos. Acid, 48 lbs.	Nitrogen, 24 lbs. Potash, 100 lbs.	Phos. Acid, Potash, 100 lbs.	Nitrogen, 24 lbs. Phos. Acid, 48 lbs. Potash, 100 lbs.	Sulphuric Acid and Lime	Complete Fertilizer.
COST PER ACRE*.....		$7.50	$5.25	$4.50	$10,88	$10.13	$9.75	$15.38	$0.80	var'ble
Aver'e Produce p. a'e.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.
CORN—73 Experiments.....	26 6	31.7	27.4	34.3	41.0	38.0	43.2	47.8	32.0	45.1
POTATOES—22 Experim'ts.	78.6	88.5	105.3	104.2	117.2	96.1	135.8	155.9	89.5	126.7
CORN, 43 Exp'ts.† Aver'e Produce	24.8	39.2	34.9	38.0	40.6	25.1	41.8	47.7	26.3	45.8
43 Exp'ts.† Ave'e Increase.		5.4	10.1	13.2	15.8	.3	17.0	22.9	1.5	20.5
POTAT'S. 15 Exp'ts.† Aver'e Produce	72.1	80.2	95.0	103.8	112.4	87.7	128.9	154.6	84.1	130.1
15 Exp'ts.† Ave'e Increase.		8.1	22.9	31.2	40.3	15.6	56.8	82.5	12.0	58.0
SWEET POTATOES—5 Ex.	74 5	133.9	102.3	164.3	124.5	195.2	164.9	214.2	(60.0)	272.7
TURNIPS—3 Experiments..	204.6	425.0	416.7	387.7	477.0	454.0	489.7	601.0	412.0	440.0
SUGAR BEETS—1 Exper't.	705.3	1013.8	1174.0	851.3	1116.0	988.3	1090.6	1118.6	960.0	
ONIONS—1 Experiment....	290.0	530.0	510.0	680 0	620.0	500.0	650.0	610.0	400.0	890.0
OATS—3 Experiments.....	19.9	30.7	33.6	19.7	46.3	36.7	29.1	37.2	24.1	
Av'e in Increase p. a'e										
CORN—73 Experiments.....		5.1	10.8	7.7	14.4	11.4	16.6	21.2	5.4	19.9
OATS—3 Experiments.....		.8	13.7	.2	26.4	16.8	9.2	17.3	4 2	7.5
POTATOES—22 Experim'ts.		9.9	26.7	25 6	38.6	17.5	57.2	77.3	10.9	48.1
SWEET POTATOES—5 Ex.		59.4	27.8	89.8	50.0	120.7	90.2	139.7	14.5	198.2
TURNIPS—3 Experiments..		220.4	212.1	183.1	273.4	249.4	285.1	396.4	207.4	235.4
SUGAR BEETS—1 Expe'nt.		218.0	378.4	56.0	320.7	193.0	294.3	323.3	164.3	
ONIONS—1 Experiment....		240.0	220.0	390.0	330.0	210.0	360.0	320 0	110.0	100.0

* At market price, plus $5 per ton for freight and applying.

† Averages of Experiments in which farm manures were used.

The Best Fertilizers for Different Crops.

6.—To prescribe formulas fitting all cases is utterly impossible. The needs in any case, and the effects of the different materials, are decided by numerous factors, of which the most important are soil, season, tillage, feeding capacity of the crop, and indirect action of the fertilizers. The character of the season can not be foretold. The wants of the soil can only be learned practically by experiment. Of the feeding capacities of different crops, much is already known, and experiments like these are telling us much more. As to the indirect action of fertilizers in improving the texture of the soil, and setting plant food free, science has taught us a great deal, but more research will be needed before we shall be able to lay down general rules, with certainty.

Formulas for Fertilizers.

7.—I am continually receiving requests for formulas for fertilizers for different crops, and such letters just received are before me. The best answer I can make is this: The first and most important thing to be found out is what your soil lacks. That I can not tell you. It may be Phosphoric Acid, or Potash; perhaps Plaster or Lime may help, and possibly the trouble may be one that fertilizers will not help, at least not until the soil is drained, irrigated, or better tilled. The best advice I can give is to experiment on a small scale, find what materials are most effective, and profitable, and then use them. But if one cannot or will not do this, he can either use Guano, or Phosphate, or Bone, or Potash Salt, and take the risk of its fitting the case; or use a complete fertilizer which contains all the materials that soils generally lack. In the latter case one risks paying for some ingredients that will give no adequate return.

As to special formulas for different crops, I make no prescriptions. The intelligent dealers who do so, know very well that it is for their interest to make their mixtures such as will on the average bring the largest practicable profit to the consumer, and are very careful to get the best results of research and experience and use them in preparing their materials. Some I know to be among our most enthusiastic and successful students of these subjects. I can suggest no better formulas than many of those in actual use by trustworthy dealers.

8.—Leaving variations in soil and season out of account, and considering the feeding capacity of the crops, as shown by these and other experiments, and by general experience, it is safe to say that: (1) For *Corn*, an excellent fertilizer to bring large crops, is a mixture of Peruvian Guano and Muriate of Potash. To this it might be profitable to add some fine ground Bone or Superphosphate. In the majority of cases, though not always, a more profitable mixture would probably be one of Muriate of Potash, with either Superphosphate, or fine ground Bone or both. At the same time there are cases in which Nitrogen helps the crop enough to make it profitable, and in which Nitrate of Soda, Sulphate of Ammonia, Dried Blood, Guano, or Fish, would be in place. (2) For *Potatoes*, which respond more generally than corn to both Nitrogen and Potash, such of the above mixtures as contain considerable Nitrogen would generally be in order.

As to Commercial Fertilizers in General.

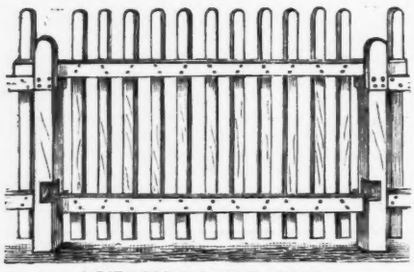
9.—For general farming, at a distance from the large markets, the chief use of commercial fertilizers should be to supplement the manure of the farm. The right way is to make the most and best manure that is practicable upon the farm, and piece out with such commercial fertilizers as experiments and experience prove profitable. At the same time there are many cases, especially near cities, were every thing depends upon getting the largest and best yield, and where more exclusive use of chemical fertilizers is advisable.

10.—Either the combined testimony of these experiments, similar ones elsewhere, and the best experience are totally false, or chemical fertilizers bring larger, better, and even surer crops than farm manures. That rightly used, they must become a more and more potent means for the restoration of the agriculture of our older States, it is useless longer to deny. W. O. ATWATER.

Wesleyan University, Middletown, Conn.

A Lift Gate.

One of the conveniences about our garden is the ease with which it can be thrown open, by means of lift gates, when any carting is to be done. To all appearance there is only one gate to the garden—the small one on the side nearest the house, which swings upon hinges. The garden is enclosed on all sides by a picket fence, and in this fence at three places there are lift gates, one of which is shown in the accompanying engraving. The construction is very simple, and the extra cost over that of an ordinary length of fence is but trifling. Two notches are cut in the posts to receive the ends of the lower cross-bar. The upper portion of the gate is held in place by cleats upon the inside of the

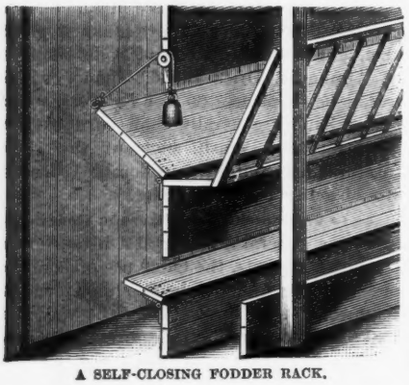


A LIFT GATE FOR THE GARDEN.

post, and the end pickets upon the outside, between which the ends of the upper bar pass and rest upon the upper bar of the fence.

A Feed Rack for the Stable.

Mr. E. H. Hopkins, Ontario, Canada, sends among other sketches those of a feed rack, from which the engraving is made. The upper rack is for hay, and is opened by a low door in front, which lets down by means of cords and weights. The weights are so balanced that when the hay is eaten out, the door closes up and is out of the way. A second rack, or a trough, which is shown at the bottom, is



A SELF-CLOSING FODDER RACK.

also opened from the passage-way by means of a long door, without cords and weights. This is for feeding roots and other similar material that the cattle could not conveniently take from the upper rack.

Health of Farm Stock.—The spring is a critical season for farm animals, and every precaution should be taken against disease. If one will consult any standard work on "Diseases of Domestic Animals," he will find that the great source of trouble among farm stock is a lack of neatness about the stables, the poor quality of the feed, water, etc.—in fact, that the diseases are due to the improper care of the animals. The breathing of fetid gases arising from filthy stables and decomposing manure heaps, is alone enough to induce disorders of a serious nature; but add to this the drinking of water from barn-yard wells that receive surface water at every rain, and so polluted as to have an easily recognized taste and color, and it is a wonder that the animals live at all. Many of the disorders, distempers, fevers, etc., which visit the whole "herd" at times, are not so much "in the air," as in the water and the stable.

Some of the Results of Our Field Experiments.

A series of experiments, conducted and reported by nearly two hundred intelligent farmers on a common plan, through three successive seasons, and so faithfully done that over one hundred of the reports are sufficiently full and thorough to be capable of accurate and reliable tabulation, must bring results of great value. Hitherto we have been compelled to rely mainly upon European investigations for our facts regarding the nutrition of plants and the action of manures. Dr. J. B. Lawes, of Rothamsted, England, unquestionably the foremost field experimenter in the world, in writing, in 1873, to the Treasurer of the Massachusetts Society for the Promotion of Agriculture, said: "The best possible manure for all graminaceous crops—wheat, barley, maize (corn), oats, sugar-cane, rice, and pasture grass, is a mixture of superphosphate and nitrate of soda.... Potash is generally found in sufficient quantities in soils, and the artificial supply is not required." In more than half of the experiments with corn, and in nearly all with potatoes, the crops have been materially aided by potash salts, and without them they have often failed. Several years ago the Professor of Agriculture (now President) of one of our leading Agricultural Colleges, proposed a formula for a corn fertilizer which, with a moderate proportion of potash, and a small amount of phosphoric acid, supplied nitrogen at the rate of 64 lbs., and at a cost of over $15 per acre. Later, a promoter of agricultural science has enthusiastically advocated the culture of corn with chemicals, recommending for the purpose, and using in an extensive series of experiments upon his own farm, a fertilizer which supplied nitrogen at the rate of 90 lbs., and at a cost of $18 to $20 per acre. Mr. Lawes, in a letter written three years ago, gives it as his opinion that corn, to produce full crops, would require large quantities of nitrogen to be supplied as ammonia or nitric acid. But as shown in the article in the *American Agriculturist* for March (p. 97), our experiments tell a very decisive story against the use of nitrogen for corn. The nitrogen increased the crop enough to pay its cost in only thirty trials out of one hundred and fifty. The pecuniary *loss* rose and fell with the amount of nitrogen used. The corn grew well with mineral fertilizers alone. As to the much discussed question whether corn is an "exhausting" crop like wheat, or "renovating" crop like clover, our experiments imply that though botanically it is more closely allied to wheat, it comes in this respect nearer to clover, and that usually it may be successfully grown with the inexpensive mineral fertilizers, superphosphate and potash salt, and gather the costly nitrogen from natural sources, to be fed on the farm, and make manure to renovate the land.

Tim Bunker on Hookertown Turkey Lore.

MR. EDITOR.—The subject of raising Turkeys has been up for discussion in the Hookertown Farmer's Club lately, and as what Hookertown don't know on turkeys is n't worth knowing, I thought I would send you some notes. Seth Twiggs came up to my wood shed, where I was sawing and chopping my wood for summer and next winter's use, the day before the meeting, and says he: "Squire Bunker, have you heerd on't?"

"No I have n't. What's up now?"

"Wall there's gwine to be a turkey talk at the school house to-morrow night, Mr. Spooner is gwine to open the subject, Deacon Smith is gwine to show his stuffed gobbler, and the wimmen folk are comin out to tell what they know abeout turkeys. Is Mrs. Bunker gwine?"

"I should not wonder if she did," said I. "She has raised turkeys enough to fill the barn if they could all be put together. Sally and I have been running the farm for more than thirty years, and she never has failed on that crop once. Hookertown has not a better poultry woman in it, though I do say it."

"Wall I thought she'd go," said Seth, "my wife said she'd go if Mrs. Bunker did. Tirzah Twiggs hain't any notion of gwine to a meetin, and makin a fool of herself. She says she'll tell her 'speriance if the rest of 'em du, and she is glum, if they don't."

At the meeting which Seth had announced the school house was slicked up for the evening, for it is only on special occasions, when subjects of particular interest to the ladies are up for discussion, that they honor us with their presence. The big 42-pound Bronze Gobbler which Deacon Smith raised and had stuffed was present upon the table, and attracted quite as much attention as the speakers. It was a magnificent specimen of the Bronze variety, a past three-year-old that had sired three of the best flocks the Deacon had ever raised. In honor of his useful life, he had the bird stuffed and thus made useful, and beautiful, in death.

Mr. Spooner, our minister, who still flourishes at the parsonage, and cultivates the church glebe, opened the subject with a brief description of

The Wild Turkey,

from which our domestic turkeys are descended, and which are often used to bring fresh blood, and stamina, into our domestic flocks. He said the wild turkey, *Meleagris gallopavo*, was originally found in all parts of the United States east of the Rocky Mountains, and as far south as the Isthmus of Panama. When the country was first settled this game was very abundant, and with the deer and the buffalo formed a large part of the animal food of the Indians, and of the early settlers. They had stood their ground against the advance of civilization much better than the deer and the buffalo, and are still to be found in the wooded and mountainous regions of some of the old States, and quite plentiful even upon the borders of civilization. They are still hunted on the Alleghanies, and sometimes a wild gobbler will invade the farm yard in the new settlements, drive off or kill the tame cock, and take possession of his flock. On the borders, it is a very common thing to introduce the wild birds. In some of the new States wild turkeys are so common that it hardly pays to raise the domestic birds. In

some parts of Florida, Georgia, the Carolinas, and the Gulf States, the wild turkey is still frequent, but less so in the western parts of Virginia and Pennsylvania. Some also are said to exist in the mountains of Sussex Co., New Jersey. He said, with suitable game laws, he had no doubt they could be restored to any part of the country, where there were extensive forests, and nut-bearing trees were plenty. But the perpetuity of the wild bird was of small importance in comparison with the breeding development of the domesticated bird. The turkey stood at the head of all our poultry birds for size, beauty, and usefulness. No other bird paid so well, where there is a good range, and he thought, as he rode over the country, he could mark the homes of the most thrifty farmers by the size of the turkey roosts, and the number of turkeys. They picked up their own living more largely than any other domestic fowl, and in the destruction of insects, they are a very important factor. He was glad to see the increasing interest in the turkey crop, and he hoped all the poultry men and women, who were present, would contribute their experience to the general stock of information. Hookertown stands high in the Boston and Providence markets, for its large-sized and well fattened turkeys. The best show of dressed turkeys he has ever seen, was in Quincy Market, Boston, last Thanksgiving. Still there was room for improvement.

Uncle Jotham Sparrowgrass rose, with a heavy thump of his cane upon the floor, and said he thought the best improvement that could be made on turkeys was to send 'em back to the woods where they came from. "I used to raise turkeys some, when I was over on the Island, but I gin' it up long ago, as a bad crop. They are tender things when they are young, and when they git bigger, and begin to stroll, they always keep a man in a peck of trouble. They wander off to the neighbors, and are death on cabbage and turnips, and that makes hard feelings. They get mixed with other folks' turkeys, and if they all happen to be bronze, there is no telling which from tother, and however you divide, there is hard talk, and sometimes a quarrel that lasts years. They tangle the grass, break down the oats, rob the rye and wheat fields, and eat their bodies out in corn, several times, before they are fit for market. If you want peace among neighbors don't raise turkeys."....Deacon Smith spoke upon

The Importance of a Good Range.

"There is some truth in what Mr. Sparrowgrass has said, but it is applied to thickly settled regions, where farms were small and market gardening was followed. The turkey wanted a good deal of room, and should not be bred in the near neighborhood of villages, or where the larger part of the farm was occupied with hoed crops or grain. It came in appropriately with dairy farming or stock-raising. A large part of the profit of raising these birds consisted in their ability to get the most of their living from the pastures and woods, from June until October. In a region of large farms, the evils spoken of could be mostly avoided. They were very tractable, and by suitable attention they could be kept within reasonable limits and would come home to roost with as much regularity as hens. They wanted large pastures, and woodlands to roam in, especially forests of nut-bearing trees, the various oaks, the chestnut, and the beach. They were very useful in destroying insects, and of great service in orchards in devouring windfalls, and in preventing the growth of worm-eaten fruit. The turkey crop is so profitable that there is generally no difficulty among large farmers in having a good understanding about raising them. They will agree to keep birds of different breeds or colors so that they can be easily separated when the flocks get mixed, and to report the estrays when they give trouble, or to drive them home.

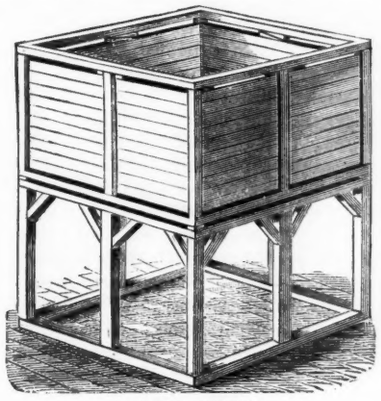
A Suitable Breeding Yard

is also very desirable, and will forestall many of the difficulties that attend the business. This yard should be near the house, and if you plant it with fruit trees, it will be all the better for the fruits, and the turkeys. Apples, pears, plums, and peaches, are suitable fruits for such a yard, of a quarter or half an acre. The brush from trimming the trees may be left in piles, for the turkeys to make their nests in, or a large shed may be built upon one side of the yard fitted with nests for laying and setting. If this shed has a floor and sliding doors in front, it may be made proof against vermin, rats, skunks, weasles, cats, dogs, crows, foxes, etc. It will be found very convenient not only in hatching, but in protecting the young birds against storms, The common practice of leaving turkeys to select their own nest, in the woods or by the road side, is exceedingly wasteful. Predacious birds and foxes very frequently destroy both old birds and young. With a very little more care, a young brood of turkeys may be made as safe as a young brood of chickens, for two weeks after hatching, which is the most critical part of their lives."

Hookertown, Ct., April 10, 1881. } Yours to command, TIMOTHY BUNKER, Esq.

A Cistern for the Barn or Loft.

A cistern is most frequently built in the ground, and in March we published one among the many plans of an underground cistern that we have given from time to



A BARN CISTERN.

time. But there are cases when it is not convenient to build beneath the earth's surface, and an elevated cistern in the barn or elsewhere may be constructed. Such a cistern may be put up at a moderate cost in the following manner: If possible locate the cistern in the south-west corner of the barn, as there it will be more exposed to the sun than elsewhere, and therefore warmer—an important matter in winter. The cistern must be supported upon a frame of timber which must be strong in proportion to the weight to be sustained. Hard-wood timber, 10 by 10 inches, is heavy enough for a cistern twelve feet square. There should be three cross sills, two end sills, and eight posts, as shown in the engraving. The floor and sides of the cistern or tank should be made of grooved and tongued plank two inches thick, and each joint must be thoroughly tarred when it is put together. The corners will need to be well fitted and carefully caulked. An overflow-pipe should lead from near the top of the cistern to a drain below. The gutters or leaders from the barn must be arranged to conduct the water from the roof to the cistern. The water for use is taken from an outlet at the bottom of the tank. We have seen cisterns like that here described in use, and know that in some cases they are preferred to those underground. Not the least advantage is, that the water flows to all parts of the barn and to the yard, etc., by its own weight, and the labor of pumping, necessary with an underground cistern, is in this way avoided.

Forwarding Melons and Other Plants.

Probably every one who has a garden in the Northern States, wishes, for one reason or another, that the season had been a little longer. Melons, especially, are apt to be caught by the early frost, and the promise of a fine crop blighted. It is easy to lengthen the season, but it must be done at the first rather than the last end of it. This may readily be done by those who have hot-beds and cold frames, with which to *forward* the plants. This term "forward" is a convenient one, and is applied by gardeners to whatever hastens the ordinary growth. Melons and various other plants may be forwarded in the farm-garden at a very slight expense. That the sun warms the earth during the day is a well-understood fact, that this heat, or a portion of it, is lost during the night, is equally well known. Now, if a portion of the earth in which plants are growing be warmed during the day, and we prevent it from losing this heat during the night, it is evident that such plants will have a great advantage over those without such protection. All our melons, cucumbers, squashes, and other plants of that family, come from tropical or warm countries, and in order to yield the best returns in our northern gardens, need every advantage we can give them. Every one may not find it convenient to start his cucumber, melon, and similar seeds, on pieces of sod, or in pots, in a hot-bed or frame, but he may greatly hasten, or forward the same in the open ground. All the expense or trouble required is, to make a lot of frames, one for each "hill," of six or eight-in. boards, and a foot square. It may be more convenient to get boxes from the store, at little or no cost. It makes no difference if the boxes are somewhat larger than the size named; the object is to get a box without top or bottom. Over such a box or frame, tack a piece of thin muslin or cotton cloth, and the thing is ready. Sow the seeds in the usual way, and every afternoon, when the day begins to be cool—soon after 3 o'clock, usually—turn these frames over the "hills." This will hasten the germination of the seeds, and when the plants come up, continue to protect them in this manner. If a cold windy day occurs, it will be better to leave these covers on than to expose the plants to the weather. This use of the covers or frames may be continued until

the plants get too large for them. Not only will plants thus treated be much ahead of those without such protection, but they will also be largely preserved from the attacks of the "striped bug" so injurious to melons, cucumbers, and related plants, especially when

FIG. 1.—A PERSPECTIVE VIEW OF THE COTTAGE WITH DAIRY.

young. Of course the use of these requires some attention, and the leaving off of the covers during a chilly night may undo all that has been done; but gardening requires attention, and whoever has once used these or some similar covers will not give them up.

Houghton Farm Dairy.

The basement of a cottage situated on a bank near the cattle barn has been converted into a convenient Dairy, by building a one-story annex on the west side, the front of which, on the level of the foot of the bank, forms the entrance. As the plan and internal arrangements of the Dairy are entirely new, a detailed description is of interest. A view of the Cottage, with Dairy attached, is shown in figure 1. The Cold Room for setting milk is in the north end of the cottage basement. The ice box, 12 feet long, 3 feet wide, and 4 feet deep, is made with 4-inch posts, boarded on the inside with 1 by 6-inch boards, laid two inches apart (*x*, figure 3), to allow the air to come in contact with the galvanized iron lining that covers the sides. The bottom of the ice box, *f*, consists of a grating of oak plank. Underneath this is a sloping floor of inch boards, *g*, covered with sheet zinc to carry off the water from the melting ice to a pipe at one end, which discharges into the drain. The circulation of air in the cold room is shown by the arrows in the sectional view in figure 3. The wall between the Wash Room, *c*, figure 2, and the cold room, *a*, is of brick, in two sections. The upper one, projecting into the cold room, rests on a beam 8 by 8 inches square, supported on columns at the highth of 2 feet from the floor. The lower section of the wall is built from the floor on the wash room side, one foot back from the upper section, thus leaving a space between the walls which is divided by partitions into squares of one foot each, through which the cans of milk are set directly into the lowest stratum of the cold air of room *a*. The details are given in the section of the wall shown in figure 3. *C* is the cover of one compartment consisting of an inch board 12 inches square, with a hole in the center to receive the ventilating tube of the milk can, *c*. A lid, *b*, is hinged to a truss beam supporting the back wall, covering several of the spaces for setting milk cans. When *b* is turned up, it is fastened by the button, *i*. There is an air space, *a*, between the two covers communicating with the Churning Room by an inch glazed pipe at one end, and with the wash room by a similar pipe at the other end, as shown on ground plan, figure 2. The door between the wash room and churning room, and the double doors between the churning room and cold room, *g*, are made as shown in figure 4. Above the door is a 6-inch opening closed by a valve that can be adjusted to regulate the passage of the warmer strata of air from one room to another, while at the bottom of the door is a similar opening with a valve to regulate the passage of the lower or cooler stratum of air.

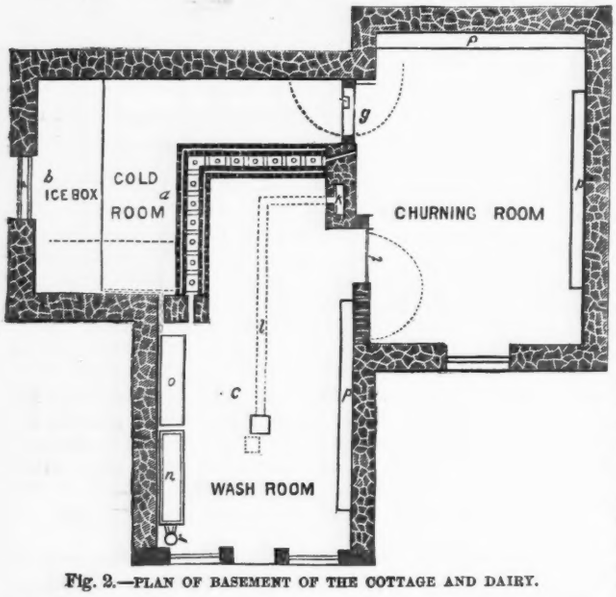


FIG. 2.—PLAN OF BASEMENT OF THE COTTAGE AND DAIRY.

By means of these ventilators the temperature of the churning room can be readily controlled by admitting warm air from the wash room by the upper register to raise the temperature, while the cooler air of the churning room passes through the lower valve to the wash room. To lower the temperature of the churning room, the ventilators opening into the cold room are used in a similar manner. In the wash room the stove, size 3, with boiler for hot water, is in the middle of the room; the pipe, *l*, is connected with the flue in the chimney at *k*. The sink, *n*, is used for washing utensils, the water being discharged by a pipe into the drain, *r*. At *o* is a table, and *p*, *p*, *p*, are ranges of shelves. The cold room, with its supply of ice, can be kept at a temperature of 40° to 45°, where the milk is set, while the churning room can be kept at 60° to 65°, or the proper temperature for churning. In the ceiling of the wash room is a ventilator, one foot square, the outlet of which is shown on the roof in the elevation, figure 1. The milk, when brought from the barn, is taken to the wash room and immediately placed in the cold room by means of the lid

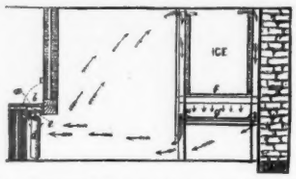
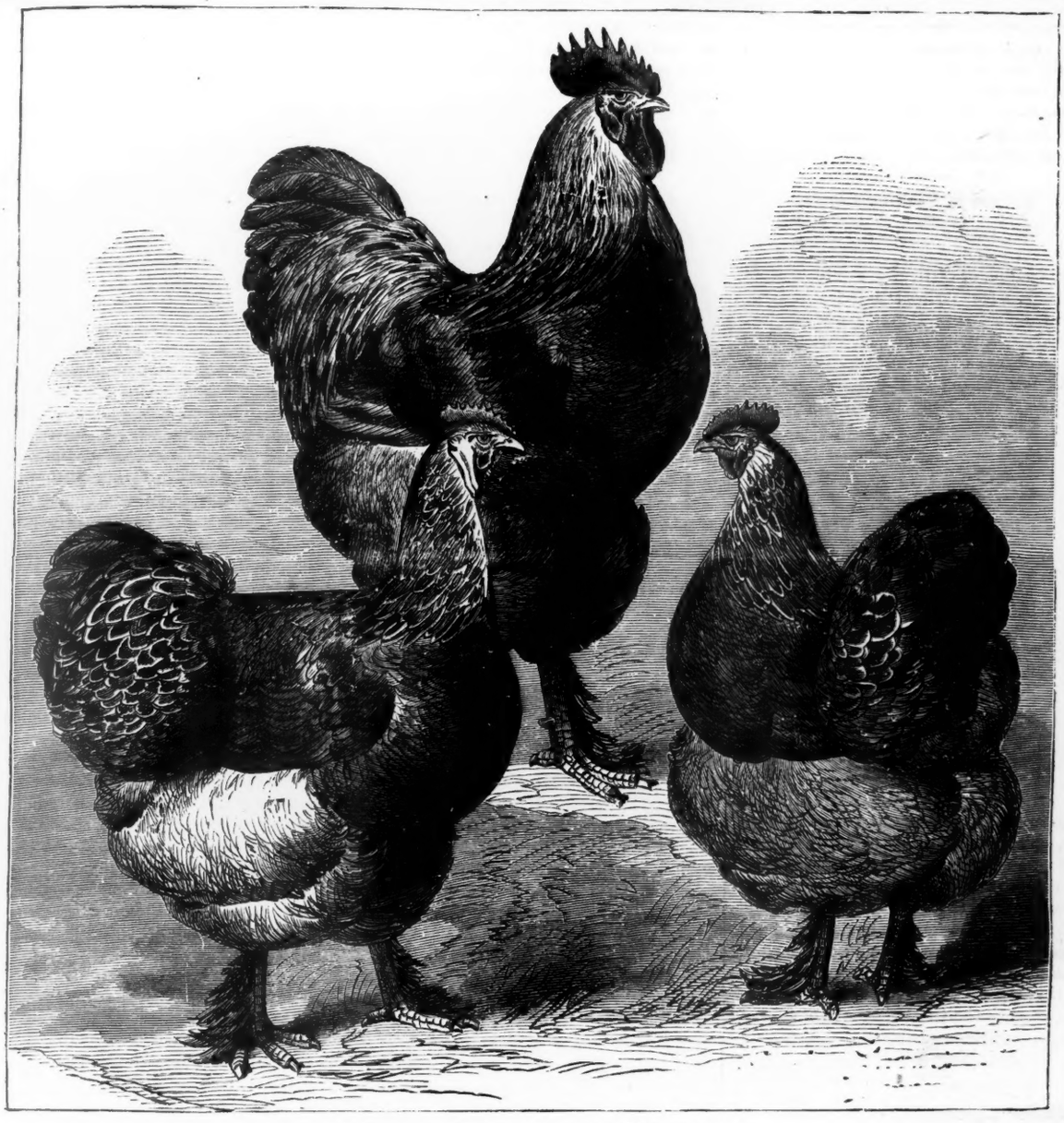


FIG. 3.—SECTION OF ICE BOX AND COOL ROOM.

in the partition wall, without opening the door to allow the cold air to escape. The cream rises in 12 to 18 hours, and the cans may be taken up through the opening and carried to the churning room without opening the cold room, or if more room is needed, they may be set back on the floor of the cold room, and other cans may be put in from the wash room. In the inner door of the cold room, figure 4, is a light of glass, with a shelf on the outside, on which a lamp may be placed to throw light into the cold room whenever any work is to be done there.

FIG. 4.

Ashes and Plaster.—The works on gardening of the last generation said nothing about guano and other fertilizers, as these were unknown to them. They very generally advised the use of "ash compost," made of equal parts of sifted, unleached Wood Ashes and Gypsum or Land Plaster. Old fashioned as this may be, it is a capital thing to have on hand. It, of course, should be kept under cover and perfectly dry. When squashes, melons, or any others of the family first break ground, give them a dusting of this mixture of ash-compost. This will protect the young plants from the "striped bug," and its use may be continued with advantage until the vines get so strong as not to care for this enemy. As a top-dressing to almost any garden crop, it will be found beneficial.



A TRIO OF PARTRIDGE-COCHIN FOWLS.

Partridge-Cochin Fowls.

The Cochin breed of fowls was introduced into this country about the year 1847, and to this is mainly due the celebrated "poultry mania" long to be remembered by breeders of domestic fowls. Men became almost wild after Cochins, and were willing to spend a small fortune for a trio of fine birds. The principal sub-varieties of the Cochins are the White, Buff, and Partridge. With those who breed the White variety, every feather must be pure, otherwise the fowl is looked upon with disfavor. The Buff Cochins may be of any shade, but the birds in a flock must correspond in color. Among the most admired of the Cochins is the "Partridge" variety, or sub-breed, a fine trio of which is presented in the accompanying engraving. The neck-hackles of the hens are bright gold, striped with black, the rest of the body being light brown, pencilled with a darker shade of the same color. The hackles of the Partridge-Cochin cock are bright red, striped with black, the back being dark-red, with a bar of metallic green upon the wings. The breast and under part of the body are pure black. Some of the points of merit, as claimed by the breeders of these fowls, are as follows: They are hardier than any other breeds, except the Brahmas, and will thrive under conditions where most others would perish. They are of large size, with a very gentle disposition, and the ease with which the Cochins are kept in confinement makes them favorites with many poultry raisers. When full-grown, the weight ranges from 10 to 15 lbs.; they are too heavy to fly, and a fence 2 feet high will confine them. As sitters and mothers the hens are not surpassed and are prolific layers, especially in winter, when eggs are scarce. The chickens grow rapidly, and at three months are large enough for eating.

It is true, they have some defects. The flesh is inferior, especially of old birds. The inclination to sit sometimes interferes with their greatest usefulness. This tendency is developed by over-feeding. As a breed the Cochins are most useful to supply the demands of a family for early chickens and a plenty of large, rich eggs. If the Cochins had done nothing more than to awaken a general interest in poultry breeding, their introduction would still have been of benefit.

Broad Wheels for Farm Wagons.—The surface over which loads are drawn upon the farm is soft, as a rule, and a wheel with a broad tire will not sink so far as a narrow one. A load of manure or hay can be drawn across plowed or other mellow ground, upon a wagon which has tires four inches wide, when it would be impossible to do so with the old narrow wheels, often less than two inches wide. The usually heavy, muddy, country roads of early spring, are much more passable with the wide wheels than the narrow ones; and even upon smooth, hard roads the difference in the draft is so slight as to be no argument against the use of wide tires. Most of the teaming upon the farm is upon soft ground, and the light draft of broad-tired wagons should make them preferable, because they are a saving of animal strength. One of the first things that strikes

an intelligent European in coming to this country, is the very frail look of our vehicles, especially the narrow wheels. While these may be desirable in road wagons, those for farm use may well be with broad tires. Contractors for road work always use broad-tired carts, as they find them most profitable.

A Method of Leading Cattle.

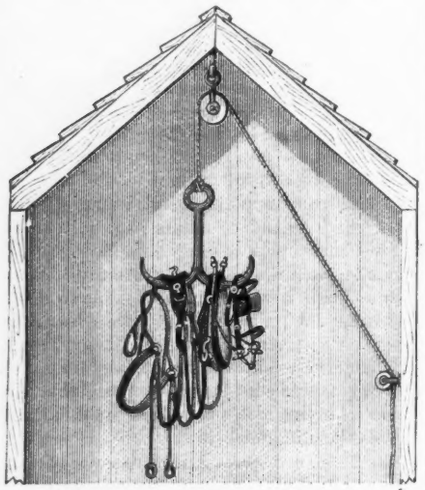
Mr. J. W. Gilman, Kearney Co., Neb., writes of an arrangement of the halter for the easy leading of cattle that are inclined to hang back. He writes: "I learned the method from a young Dane in my employ. I had two cows, neither of which would lead with any degree of comfort; to lead them both at once was out of the question. One day I noticed the Dane leading them with

A DEVICE FOR LEADING A COW.

as little trouble as if they were well broken horses. This ease in leading was due to his taking a half-hitch in the halter around one ear of each cow in such a way that it would not slip off. This idea has been worth a great deal to me."—To those who have tugged and worried over a cow that would not lead at the halter, this hint will be welcome. The engraving shows the manner of making the half-hitch of the halter about the animal's ear.

Hanging a Harness.

Mr. G. D. John, Whitesides Co., Ill., hangs his harness "high and dry out of the way of a rubbing horse, rats, and chewing calves,"



A HARNESS HUNG BY ROPE AND PULLEY.

by means of a pulley and rope. A frame or support for the harness to hang upon is attached to one end of the rope. The harness in the engraving is shown as hanging upon a large double iron hook, but a substitute may be readily provided. A piece from a tree with several branches given off at a sharp angle will answer, or a straight stick with several pins inserted in it may be used. The rope, being attached to whatever the harness is hung upon, passes over a pulley at the peak of the roof of the carriage-house and down to a convenient place at one side. The device is an exceedingly simple one, and for those who wish to keep a fine harness out of harm's way this can be recommended.

Among the Farmers.—No. 64.

BY ONE OF THEM.

Wide-awake farmers that I meet with are interested more than ever in the problem of, how to keep more stock, and with this in view, and with especial reference to milk production, they are generally discussing

Ensilage.

It seemed at one time as if all were converts to the new practice. Now, when the practical questions connected with it come up—and they ask themselves whether or not they shall spend $300, $500, or even more, many are finding reasons for leaving their money in the Saving's Banks. The wisdom of this step, from their stand-point—unwillingness to spend the money—is not clear; but it is the part of wisdom often to continue in well-tried ways, until others besides visionary tyros and scientific enthusiasts, who spend money which somebody else earned, carry the new practice to decided success. Professor G. H. Cook, of the New Jersey Experiment Station, which, by the way, is doing our farmers good service, comes out decidedly in favor of the use of ensilaged corn-fodder for milk production. His showing is not, however, the demonstration one could wish, for the quality of the milk does not seem to have been made a subject of special test, yet it must have been fair, for a marked lack of goodness in the product would certainly have been noticed and commented upon.

It is an important thing to know how much

Alcohol and Vinegar

it is safe to admit as proper ingredients in the food of milch cows. Certain it is, that vinous fermentation occurs at the expense of part of the sugar in the fodder. The mass of fresh ensilage, at the time of packing away, is charged with a pleasant vinous odor, and the amount of carbonic acid disengaged is very great—sufficient to endanger life, if care is not taken by those going into the pits. This demonstrates conclusively that the talk about *sauer kraut* is all gammon, for the fermentation which cabbage undergoes is not vinous or alcoholic at all, but *lactic*. This lactic acid is formed much as in the souring of milk. I doubt if any lactic acid has ever been discovered in ensilage of maize. After a while, no doubt, the fermentation in the tank stops. It will go on so long as there is any sugar left in the corn fodder, unless the natural ferment is exhausted, or the temperature is too cool. The latter, I opine, is quite likely to occur, for *vinous* fermentation nearly or quite ceases at a temperature of 45° F.

We will suppose that on closing the pit or silo, only a moderate quantity of alcohol had been formed, and, on opening it, the temperature remained below 45°. Then only so much alcohol as had been already formed would be converted into vinegar by exposure to the air. This would and *does* take place with wonderful rapidity—so much so that samples of ensilage, placed in jars, and sealed up tightly, often lose within 24 hours, all their vinous odor, and are so charged with vinegar as to be utterly unpalatable to any cows but those of most perverted taste. In fact, I have seen some samples from which it apparently would have paid well to have extracted the sour liquid it contained for vinegar, for as vinegar it was both sharp and good.

Now, as I have said, much alcohol is often formed in the silo, and, on opening the latter, or exposing its contents in any way to the air, a proportionate quantity of vinegar is rapidly formed. We need, therefore, an answer to the question—*How much alcohol, and how much vinegar, it is safe to feed to milch cows?*—Prof's. Johnson, Armsby, Atwater; Drs. Cook and Habirshaw, please answer—but don't all speak at once. This discussion leads us away from the main question:

Will Ensilage Pay?

To that we must ever recur. It seems to be proved that ensilage is fairish fodder—possibly better than some of us think—certainly not so good as the enthusiasts claim. It is surely unfit to use alone. Grain of some kind, or some equivalent, such as cotton-seed meal, must be fed with it, at the rate at least of 5 to 8 per cent of the latter, and proportionately more of Indian meal, shorts, etc. As winter feed, it appears to be then a substitute for roots. In the case of young stock and dry cows to be fed instead of turnips,—and in place of mangels—for milch cows.

I had a very interesting talk with Dr. Miles, of Houghton Farm, Orange Co., N. Y., the other day, and he described particularly the process which was introduced by him at the Michigan Agricultural College many years ago, which might worthily be called:

The Miles Process.

As I understand it, it is this: The corn fodder, properly cured, is cut up by horse power one and a half to two inches long. This is spread to the depth of six inches, more or less, upon some convenient space within three walls. Over this layer one of finely pulped mangels is spread (an English root pulper was imported for the College). This layer of pulped roots should have a depth of two or more inches, then comes another layer of corn fodder, then more roots, and so on until a mass four or five feet high is made. This should contain food enough to last the cows three days. This is left until a good heat comes on, when it is fed out warm, and another heap is made. The addition of bran or meal would cause the fermentation to be still more active, and the use of close-oiled canvas or tarpaulin to cover the heap naturally suggest themselves. I did not inquire of the Doctor about the minutiæ as I should have done. He said, however, that the cornstalks were thoroughly softened, and that the cattle were extravagantly fond of the fodder thus prepared, even though wheat and oat straw were often largely used. The fermentation which takes place is vinous, but the time is too short for the formation of any considerable quantity of alcohol. The ration, thus prepared, is vastly superior for feeding to milk-giving cows to one containing ensilage in its best form, according to my notion.

In the Matter of Labor,

the advantage, it seems to me, lies with the "Miles Process." Corn fodder is very easily

cut up and stooked in September, and cures with little or no difficulty, if properly handled. The weather does it little harm, and on approach of the cold season it will be found to have lost over three-quarters of its weight, so that it may be easily loaded on wagons and stacked near the barns or sheds.

We read of the enormous yield of corn fodder to the acre when converted into ensilage. It modifies our ideas of its value a little when, after figuring down the actual cost per ton to a surprisingly low figure, we find that a ton of ensilage contains only 360 pounds of dry substance. We handle 1,640 pounds of water to get the use of this 360 pounds of feed. Meadow hay and cured corn fodder contain about 300 pounds of water to the ton, and 1,700 pounds of dry substance, which I have no doubt is just as digestible as the dry substance that is contained in ensilage.

Corn fodder, when cut for ensilage, must be cut very fine, say three-quarters of an inch long. When cut for the process of fermenting with pulped roots, it need not be nearly so finely cut. Here is another saving which is of considerable moment, for though it seems much easier to cut green fodder than dry, yet I very much doubt if the power expended to cut say, one hundred stalks of the green be not greater than that required to cut the same number of stalks of dry fodder.

I must say that I have full faith that ensilage has its uses and in its way is excellent, but believe also, that some such plan as that described of using dry fodder with pulped roots may be a good deal more economical and better, especially for small farmers, and for those who produce milk in the winter months.

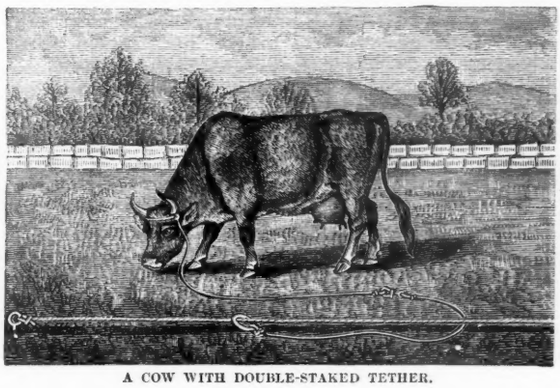
Ensilage for Late Crops.

Ensilage is only applicable to crops which can be harvested late in the season. The reason for this is clear, from the fact that we must depend upon cold weather to check fermentation, or it will go on until all the sugar is turned to alcohol. Sorghum will no doubt be a favorite crop for preserving in this way, and Southern Cow Peas seem to be another crop well adapted to ensiloing. Should we mix Corn Fodder, Sorghum, or Cow Peas with Hungarian Grass or Golden Millet, especially with the latter, the quality of the feed would be greatly improved. In my experience no fodder equals Millet in its effect on the butter. It certainly not only increases the quantity, but improves the texture, and I have no doubt benefits the flavor. Why should it not have the same effect fed out of the silo as when fed as hay, or cut green? Who will test the matter and reply?

Training a Colt.—Bad horses are more frequently made than born. It is very much in the bringing up—in the way the colt is cared for, and the manner in which it is broken. Firmness with kindness go very far in making a valuable horse. The colt should early learn that it is never to be deceived; that it is to be encouraged and rewarded when obedient, and punished by the withholding of caresses when disobedient. The same natural qualities that make a horse vicious will, with proper treatment, make one of those intelligent and spirited horses that all desire to possess. The true trainer of colts is gentle, loving, firm, and thoughtful; and the young animals under his charge partake much of the same qualities.

A Tether for a Cow.

In the Island of Jersey, where the pasturage has a richness, owing to a most favorable climate, that no part of our country can equal, it is used with great economy. The animals are not turned out to roam at will, and in choosing the herbage most to their fancy, trample under foot much more than they eat, but every cow and bull is tethered while at pasture. With our scanty pastures, this economical use of them is far more necessary than in that favored Island, and feeling that sooner or later we should find some method suited to our conditions, we have in former volumes shown several kinds of tethering. We now give the manner in which C. L. Crydorman, of Grand Forks Co., Dak. Terr., tethers his cow, which is quite

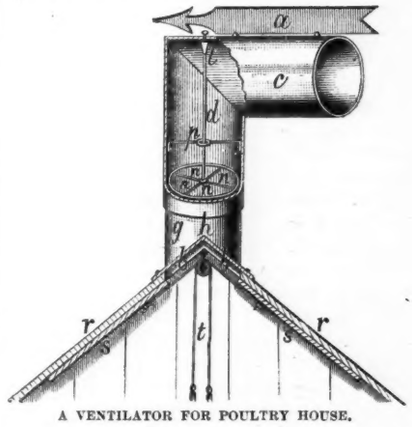


A COW WITH DOUBLE-STAKED TETHER.

unlike any we have before published. He stretches a line across the pasture, to which the cow is fastened by means of a short rope or chain, attached to a ring which runs fore and aft upon the fixed rope. His description, with the engraving made from his sketch, will make the matter plain. He says: "I use a piece of half-inch rope, 50 or 60 feet in length, and two iron stakes. These stakes are of $^{3}/_{4}$-inch iron, are 18 inches long, and pointed at the lower end, so as to drive into the ground readily. The upper ends of these stakes are turned to form an eye, just large enough to admit the rope. Each end of the rope being put through the eye in one of the stakes, and knotted, this part of the tether is ready. The rope being stretched in the desired portion of the pasture, the cow is attached to this by a rope or small chain, 10 or 12 feet long, or of such length as the abundance of the pasturage may make desirable. This, which is the tether proper, has at one end an iron ring, large enough to pass over the eyes at the ends of the stakes, and the other end is fastened around the cow's horns, observing always to have a swivel in the center of this chain or rope." The tether in use is shown in the engraving. Mr. C. says: "This is the best way for staking out cattle that I have ever seen, as it is impossible for cows to snarl themselves up, as they are apt to do with a long rope fastened at one end. It is also a great saving, as the rope will last much longer than when a great length is drawn around through the wet grass. Another thing in its favor is, you can stake the cow on a long narrow strip, as on the border of a piece of grain, by shortening the rope or chain by which she is attached to the horizontal rope. In using this tether, I first drive one of the stakes, then slip the ring of the short rope over the other stake, stretch the long rope taut, and then drive the second stake. Always drive the stakes down close to the ground, so that there will be no chance for the ring on the short rope to catch upon them, and thus make trouble. In taking off the cow, pull up one stake, slip the ring over the end, and use the short rope to lead her by."

A Ventilator for a Poultry House.

Mr. R. De Garmo, Dutchess Co., N. Y., sends a drawing of a ventilator to his poultry house, and describes it as follows: "A hole, *b*, is cut through the roof *r*, for an air passage, over which the galvanized iron collar, *g*, is securely fastened to the roof, *r*. This collar, is 9 inches in diameter, and 9 inches high above the peak of the roof. The rod, *d*, is $^{1}/_{2}$-inch in diameter, and is fastened to the inside of the collar by the four iron braces, *n*, *n*, *n*, *n*. This rod, *d*, is 18 inches long, with a small bearing at the top, upon which rests the elbow, *c*. The lower end of the elbow is made larger than the top of the collar, so that it will come down four or five inches over the collar, turn easily, and yet prevent snow and rain from driving down the collar. An iron rod, *p*, is fastened near the bottom of the elbow, with a hole in its center through which *d* passes, forming a bearing that prevents the lower end of the elbow from rubbing the collar. The air-passage, *b*, can be partly or entirely closed if the state of the weather makes it necessary by the wooden slides, *s*, *s*, which are moved by the cords, *t*, *t*, passing over pulleys at *h*, or it can be closed by slides made to run parallel with the top of the roof, without using pulleys. The slides will need to be open most of the time unless the weather is very cold. By placing the vane, *a*, at the top of the elbow, *c*, as in the cut, it will be impossible for the wind, rain, or snow, to blow down the elbow, *c*, into the house. The wind blowing against the vane keeps the open part of the elbow always from the wind.



A VENTILATOR FOR POULTRY HOUSE.

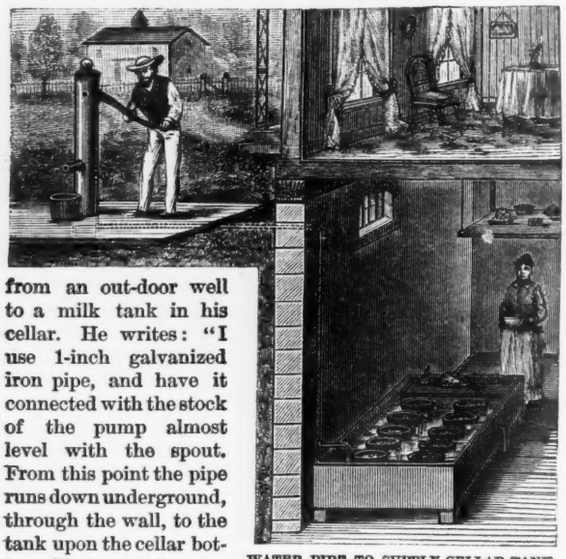
Poultry keepers will find that by using this ventilator, no matter how small their houses are, they will not have a draft of cold air driven in through the ventilator upon their fowls every time the wind changes. The engraving herewith presented is made from the neat sketch sent with the above description.

Early Lambs for Market.—A cross between a Southdown and Merino makes a

very desirable lamb for the market. These have small bone, are readily fattened, and the black faces of the Southdown make them favorites in the stalls. A Cotswold on a Merino produces a larger lamb, but it is more bony.

Water Pipe to a Cellar Tank.

Mr. Chas. F. Greenawalt, Dauphin Co., Pa., sends us his method of conducting water



WATER PIPE TO SUPPLY CELLAR TANK.

from an out-door well to a milk tank in his cellar. He writes: "I use 1-inch galvanized iron pipe, and have it connected with the stock of the pump almost level with the spout. From this point the pipe runs down underground, through the wall, to the tank upon the cellar bottom. The waste pipe may be a hollow plug placed in the center. The bottom of my cellar is gravel, and the water soaks away as fast as necessary. There are bricks placed in the bottom of the tank upon which the crocks, etc., are set. At one end of the tank a marble slab is arranged so as to reach just above the water; this is convenient for working butter, etc." A stop-cock is placed in the pipe, near the pump, to turn the water off or on. The position of the pump as well as of the pipe and water tank is shown in the accompanying engraving, made from the sketch sent by Mr. G.

Crows and Scarecrows.

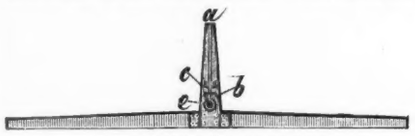
Probably there is no point upon which a gathering of half a dozen farmers will have more positive opinions than as to the relations of the Crow to agriculture. It is likely that five of these will regard the bird as totally bad, while the minority of one will claim that he is all good. As usual the truth lies between the extremes. There is no doubt that the crow loves corn, and knows that at the base of the tender shoot there is a soft, sweet kernel. But the black-coated bird is not altogether a vegetarian. The days in which he can pull young corn are few, but the larger part of the year he is really the friend of the farmer. One of the worst insect pests with which the farmer, fruit-grower, or other cultivator has to contend is, the "White Grub," the larva of the "May Beetle," "June Bug," or "Dor-Bug." It is as well established as any fact can be, that the crow is able to detect this grub while it is at work upon the roots of grass in meadows and lawns, and *will find and grub it out*. For this service alone, the crow should be everywhere not only spared, but encouraged. We are too apt to judge by appearances; when a crow is seen busy in a field, it is assumed that it is doing mischief, and by a constant warfare against, not only crows, but skunks, owls, and others that are hastily assumed to be wholly bad, the injurious insects, mice, etc., that do the farmer real harm have greatly increased. Shortly after corn is planted, the crows appear, and are destructive to young corn. Some assert that the crow pulls up the corn plant merely to get at the grub which would destroy it if the bird did not. How true this may be we do not know, but as the corn is destroyed in either case, it may be as well to let it go without help from the crow. The first impulse of the farmer, when he finds his corn pulled up, is to shoot the crow. This we protest against, even admitting that the crow does mischief for a short time, it is too useful for the rest of the year to be thus cut down in active life. Let him live for the good he has done and may do. It is vastly better to keep the crows from pulling the young corn, for two or three weeks, and allow them all the rest of the year to destroy bugs and beetles in astonishing numbers. The corn may be protected by means of "scare-crows," of which there are several very effective kinds. Crows are very keen, and are not easily fooled; they quickly understand the ordinary "dummy," or straw man, which soon fails to be of service in the corn-field. It has no life, no motion, and makes no noise, and the crow soon learns this and comes and sits upon its outstretched arm, or pulls the corn vigorously at its feet. A dead crow, hung by a swinging cord to a long slender pole, is recommended as far better than a straw man, as it, in its apparent struggles to get away, appeals impressively to the living crow's sense of caution. But the crow may not be at hand to be thus employed, and if he were, the farmer cannot afford to kill it. Better than a dead crow is a glass bottle with the bottom knocked out, which may be done with an iron rod. The bottle is suspended to an elastic pole by a cord tied around its neck; the end of the cord should extend downward into the bottle, and have a nail fastened to it and within the bottle, to serve as a clapper. If a piece of bright tin

A SCARECROW WINDMILL.

be attached to the cord extending below the bottomless end of the bottle, all the better. A slight breeze will cause the tin to whirl, and, in the motion, cast bright reflections rapidly in all directions, while the nail keeps up a rattling against the inside of the bottle. An artificial "bird," to be hung in the same manner, may be made from a piece of cork—one used in a pickle-jar—into which a number of large goose or chicken feathers are fastened so as to roughly imitate a dilapidated bird. A rough head may be carved and put on, to make the deception more complete. As this "bird" catches the wind, it will "fly" here and there in a peculiar manner not at all enticing to the corn-loving crows. The engraving here presented shows one of the best devices for keeping crows at a safe distance, as it is full of changes of motion and strange sounds, all of which confuse and "scare" the crows. It is a frame mounted on a post with a wind-mill attachment. The rotary frame has cross-bars with wires running between them, upon which bright bits of tin and highly colored cloths, etc., are fastened. As the vane revolves, it turns this frame, and the various pieces on the wires flash and flutter. Bells are hung beneath the upper bar of the affair, so that the revolving frame will hit them. A scarecrow of this kind will do more good than many times its cost expended in twine, straw men, etc.

A Home-made Drain Level.

"A Reader," Virden, Ill., writes: "I wished to get the grade for some tile drains, and made this device to get a uniform fall."—The bottom of the level is a common fence board, 16 feet long, with the lower edge dressed perfectly smooth and straight. It is left six inches wide, for about one foot in the middle, and then runs narrower towards the ends, when it is $2^1/_2$ inches wide. Another piece of fencing-stuff, $3^1/_2$ ft. long, is planed, and a line drawn down the exact center. The edges are



A HOME-MADE DRAIN LEVEL.

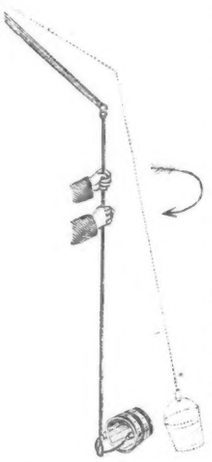
dressed down from a point 6 inches from the bottom, until it is 2 inches wide at the top. A circular hole is sawed out of the center of the bottom post, as indicated in the engraving, for a plumb-bob to swing in. The plumb line is attached by inserting it in a kerf sawed in the top, and is prevented from violent swinging by a long, shallow, wire staple seen at *b*. This piece is then firmly fastened to the center of the long piece, being careful that the line in the center of the upright piece is exactly at right angles with the bottom of the straight edge of the long horizontal board. In order to secure this position against displacement, two pieces of inch board are firmly nailed on the long board, either side of the perpendicular board. Now, set the level so that the plumb-line shall hang in the middle of the "plumb-board," from *a* to *e*, and the bottom is level. Put an inch block under one end of the level, and note with the point of an awl where the line falls at *c*, and you have the grade of one inch in 16 feet. Determine the mark for a two-inch grade, etc., in the same way. This marking should be carefully done upon a perfectly level floor, as the value of the instrument will depend upon the accuracy of this. With the scale thus constructed, the instrument is ready to use in any place where it is desired to establish a level, or a definite grade.

The Hired Man.—Every farmer who has to employ help wishes to have a *good*

hired man. He desires that the wages he pays shall be earned, and when sure of this he is too frequently satisfied with his help. A man that works upon the farm is not a mere machine; he has a moral influence, and when surrounded by children may be dear at any price. The hired man should not only be able to earn his wages, but also to exert a good influence upon the young, with whom he is likely to be more or less associated. Pay good wages, and have only whole-souled, honest, upright men upon the farm, if you would raise the best crop that the farm can produce—a family of noble boys and girls.

Handling a Well Bucket.

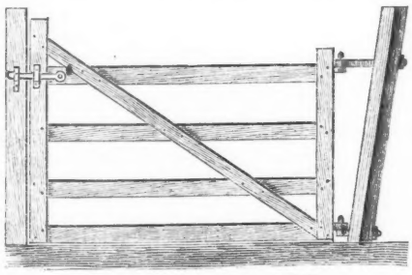
Mr. "J. J. J.," Easton, Md., writes: "Many persons have been drawing water with a bucket in the old-fashioned way all their lives, and continue to do it in as awkward a way as if the last bucketful was the first." The accompanying engraving, made from a sketch sent by Mr. J., shows the method he employs in filling the bucket. "Sink the bucket into the well, and just before it touches the water grasp the hand-pole firmly with both hands. Push the pole directly away from you as indicated by the dotted line, and at the same time give it a circular motion as shown by the arrow. Let the bucket sink into the water, as it is brought towards you, and it is quickly filled and ready to draw to the top. It is so easy and simple that a person doing it for the first time will wish he had known how before."



DIPPING THE BUCKET.

Slanting Gate Post.

The greatest trouble with hinged gates is their sagging, owing largely to the leaning inwards of the supporting post. Mr. G. W. Everhart, Parsons Co., Kans., has a remedy for this, in setting the post in a slanting position as shown in the engraving. He writes:



A GATE WITH SLANTING POST.

"If the post is square I chamfer the edge so that the bolt can go through the post from corner to corner. The upper bolt should be considerably longer than the lower one, and allow of being screwed up at any time when the gate has sagged. A gate hung in this way will rise until it is swung half way round, and then descend again, and remain open of it own weight."—We would suggest that, should the space be too large between the slanting post and gate, a piece of board could be fitted in; it might improve the appearance also of the attachment of gate and post.

A Grain Bag Holder.

Mr. A. E. Knight, Saratoga Co., N. Y., incloses drawings of a grain bag holder, from which the engraving is made. Basswood boards, $^3/_8$-inch thick, and 9 inches wide, are used for the hopper. "Each side is 23 inches across the top, and 9 inches along the bottom; the corners are stayed with hard-wood posts. The legs are $^3/_8$-inch round iron, $3^1/_2$ ft. long, flattened at the top to go into slots, *a*, on the sides of the hopper. These slots are made by fastening a hard-wood block to the hopper, with a piece turned out on the underside. The bag is hung upon three little hooks, which are made by passing three wrought nails through the corner posts, and sharpening and curving the points. One side of the hopper is cut down to receive the half bushel."—Mr. K. writes that this holder has, as he thinks, the following points of superiority: It stands firmly everywhere, is easy to make, very light, and takes up but little room when not in use. The legs can be slipped off and laid upon two pins put in the side of the granary, and the hopper can hang on another.

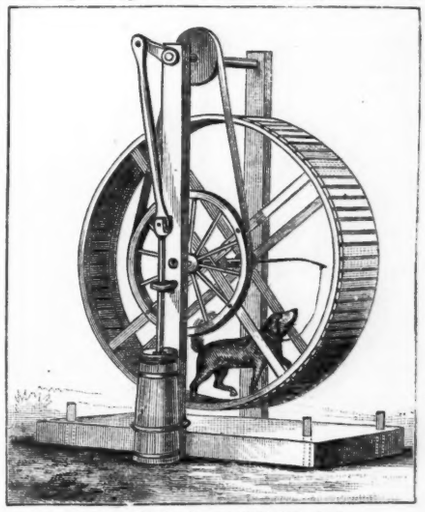
A GOOD BAG HOLDER.

How to Increase Vegetable Matter in the Soil.

The amount of vegetable matter in the soil may be increased by various methods; one is, by large applications of barn-yard manure, say 50 cords to the acre. But this would be very expensive, and is out of the question in common farming. It may be done by putting on peat or muck, when these are near to the fields. But this involves a considerable outlay for labor in digging the peat, and a still larger expense in carting it, whether it first pass through the yards and stables, or be carted to the fields for composting or spreading upon the surface to be plowed in. On some farms this may be the cheaper method of supplying vegetable matter to the soil. But on others the most economical method is the raising of clover, to be fed off upon the land, or to be turned in. If a ton of clover may be worth $9, as a fertilizer, the growing of the plant is a cheap method of improving the land. Two tons for the first crop and a ton for the second is not an uncommon yield for land in good heart. The roots of clover also add largely to the vegetable matter in the soil. The first crop may be pastured, waiting until the crop is in blossom, and then turning in cattle enough to feed it off in three or four weeks. They should be kept constantly upon the field, that the whole crop may be returned to the soil. This will of course help the second crop, which may be turned in with the plow soon after it is in blossom. If the equivalent of three tons of dried clover hay, and one ton of roots have been grown to the acre, about $36 worth of manure have been added to the soil, and it has been distributed more evenly than would have been possible by any mechanical process. There has been no expense for carting and spreading peat, or for composting. On the contrary there has been the equivalent of two tons of clover-hay consumed upon the field, worth, as fodder, $24. This will more than pay the cost of seed, of plowing twice, and other labor. This is generally admitted to be the cheapest method of increasing the vegetable matter and the fertility of soils in common farming. And this it will be seen requires some little capital.

Dog and Sheep Power for Churning.

Where there is much churning to be done, the labor, which usually falls upon women, is more than they should be called upon to perform, and the number of inquiries we have had show that some relief from this labor is eagerly sought. Among the most available devices of this kind are those in which a dog or sheep is the power, and several kinds of these machines offered for sale at the agricultural implement stores. One of the best is the "tread power," the same in principle with, but smaller than the two-horse tread powers for running thrashing machines, circular saws, etc. These are rather costly, and can not be afforded by many who could use a dog to advantage in churning. Mr. Elmer Beasley, Albany Co., N. Y., gives a detailed description of a home-made dog-power, aided by drawings, from which the accompanying engraving is made. The large "tread wheel" is constructed of two wheels placed 18 inches apart, with half-inch boards running between them nailed to the circumference. An iron shaft, 2 feet long, passes through the center of the wheels and into the standards on each side. Another shaft passes through the standards near the top, and projects six inches on one side so as to form a crank head. The attachment of this, with the churn, which stands by the side of one of the standards, is easily seen in the engraving. The standards should be not



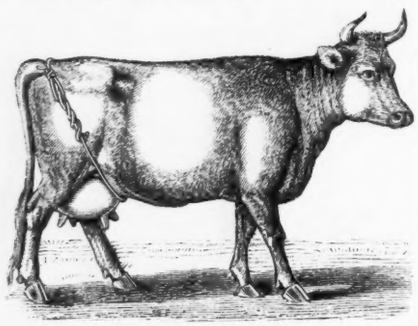
A DOG POWER FOR CHURNING, ETC.

far from 6 feet in length, and the large wheel a little less than this in diameter. The dog is placed within the large wheel and fastened by a cord to a "leading stick." Mr. B. has used his dog-power for two years, and it gives

perfect satisfaction. "A dog that weighs 30 pounds will run the 'power' and do the churning for 20 cows." We have seen sheep used for the same purpose; goats are preferred by some, as they are more active, and the exercise does them good, especially if they are kept in a stable. Anything that will make the work of the housewife easier, should be provided, especially if, as in this case, it can be done at only a trifling expense.

A Device to Prevent a Cow from Kicking.

A cow that kicks while being milked is a source of great discomfort, and any simple contrivance that will break her of the habit, is worthy of notice. Mr. O. T. Romig, Montgomery Co., Kans., writes that he prevents a cow from kicking in the following manner: "Pass a rope around her just in front of the

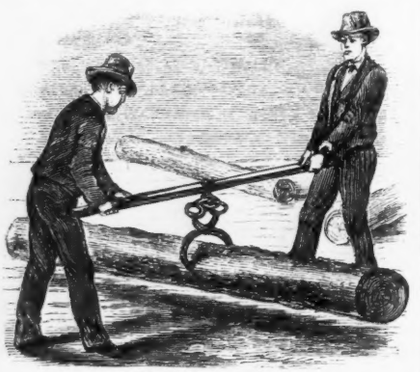


A KICKING COW TIE.

udder, and back of the hip bones on the back; draw it tight enough to be pretty snug. I make a loop in one end, pass the other through it, and after drawing up as close as wanted, twist the end under, and the work is done. With a rope thus adjusted, it is difficult to induce a cow to kick." The method of arranging the rope is shown in the engraving.

A Handy Log-Lifter.

Mr. E. F. Batcheller, Worcester Co., Mass., has a method of handling logs which he describes with the aid of a sketch. The device consists of a long stout pole with two iron prongs, like a pair of ice tongs fastened in the middle. The tongs catch hold of the log, and two men, one at each end of the bar, carry the log along. "It saves time, labor, wetting the



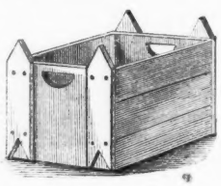
A HANDY LOG-LIFTER.

hands and bending the back. No one ever using one would lift logs without it." The log-lifter and method of using it is shown in the engraving, made from Mr. B.'s sketch.

A Wheelbarrow is a most useful farm vehicle, yet many farmers who have a fine carriage go without the humble wheelbarrow. The barrow with movable side boards is the most convenient upon the farm and about the yards. In making a selection, that with a large wheel, with the high front board projecting well forward, is best. A wide tire is also to be preferred, as the surface is often soft where a wheelbarrow is used. One can not do much gardening without a wheelbarrow, and it is most useful in bringing the wood from the yard, where it is sawed and split, to the shed, in which it is piled for use. When not employed a wheelbarrow, like other vehicles, should be housed, that it may be preserved in good order for many years.

A Bushel Box.

Mr. John G. Weber has constructed a bushel measure in the following manner: The box is nearly square, the end-pieces being one inch higher than required for the measure. The cleats at the corners are put on with clinch-nails; the box, when finished, appears as shown in the engraving. Bushel boxes that are made of the form here given, can be stacked one over another, as high as one can reach, without any danger to the contents. Mr. W. has found them useful for handling tomatoes and similar fruit.



A BUSHEL BOX.

The Rye Crop.

It is a question on many eastern farms whether the Indian corn crop pays. So many things pay better, and western corn is so cheap, that many have given up raising it. But rye is growing in importance in the vicinity of all large towns, by the great demand for the straw for bedding, and for manufacturing purposes. For the last four years we have sold the straw at an average price of $20 a ton, falling but little short of the average price of hay. If only a ton can be raised to the acre, in addition to 15 bushels of grain, it makes quite a handsome income from an acre of land. The labor on the crop is small and comes at a time when other work is not pressing. We use rye as a cleansing crop for old pastures. Most pastures that are not grazed by sheep tend to relapse into brush. Patches of whortleberries, blackberries, sweet fern, and other shrubs extend year by year until the grass dies out. Something may be done to suppress the growth of brush by persistently mowing with a bush scythe, but this must be followed up yearly, and is quite as expensive as the plowing and cropping with rye. The plow and harrow, with the growing of rye for two years, effectually destroys the brush and gives a clean pasture for several years. The land is plowed in August, and the rye put in with a harrow, not later than the tenth of September. We have used to great advantage a half ton to the acre of fish scrap, fresh from the factory. It is drawn upon the ground, and composted with surface mould a few weeks beforehand, and then spread broadcast upon the field and harrowed in. A second cross-harrowing covers the rye. The advantage of this early sowing is that the plants become well rooted before frosts come, and they survive the winter in good condition. In the spring we sow clover and red-top before the frosts are gone. Much of this seed catches and furnishes good fall feed, after the grain crop is harvested. The expense of plowing is about $2 an acre, of sowing and harrowing twice, $2, of harvesting with the horse reaper, $1, and the threshing, done by job, one-eighth of the grain, which will not vary much from $2, making $7 for labor, and about the same for manure. The grain will just about cover the cost of the manure and labor, leaving the straw clear profit. This is more highly esteemed for bedding by the livery-stable keepers than any other kind of straw, and is also used to a considerable extent in the manufacture of paper. The price varies from $15 to $25 a ton, according to location and facilities for market. The advantage of the rye crop is not confined to the value of the straw, for the grass is increased for several years, which means more milk, butter, cheese, beef, wool, lambs, and mutton. If the farmer is wise he will keep his pasture clear of brush by grazing with sheep at least in the alternate years. The labor for the succeeding rye crop will be lessened by a clean pasture. CONNECTICUT.

A New Agricultural Plant.—Soy.

The European Catalogues, and some American ones, offer "A new Agricultural Plant," the very old Soy, or Soy Bean. This they offer as "*Soja hispida*," though modern botanists unite *Soja* with *Glycine*. Some speak of it as a pea, and others as a bean, the latter being more nearly correct as its relationships are nearer to the bean. It forms an erect plant about three feet high, and very bushy, its many hairy branches bearing three-parted leaves and inconspicuous flowers, followed by hairy pods, each with two to five seeds, which are oval and "nankeen" colored. It is claimed that the plant resists the heat and drouth, and produces an abundant crop of seeds, which are valuable as food for both

A NEW AGRICULTURAL PLANT (*Glycine hispida*).

man and cattle, and that the fodder is also readily eaten by sheep and cattle. The plant is a native of Asia, and the seeds have long been used by the orientals, who ferment them and produce a dark-brown liquid, which is salted and made into a sauce called Soy. To judge from the engraving, this is closely re-

lated to, if not identical with, the "Japan Pea," which was introduced some six or eight years ago, with strong claims as to its great value. The catalogues say that it should be sown "in rows 12 to 15 inches apart." We would suggest to those who wish to try it to give it at least twice as much room as this.

A Dangerous Pest Among Grasses.

Some seeds, among them several of the grasses, are provided with admirable arrangements to promote their distribution, but these at the same time often permit the grass to be a nuisance to the traveller. Whoever in the far West has found himself in a state of torture until he could take off his flannel shirt and remove the cause, will not, as he picks out the grass seed, no larger than a pin, but much sharper, be much in admiration at the method by which the "Drop-seeds" (*Muhlenbergia*) are distributed. These and others are simply annoying, but there is one, at least, really dangerous. This is the "Porcupine - Grass," *Stipa spartea*, found from Illinois northwestward into the British Territory, and southward in Arkansas, Nebraska, etc. The Stipas are one-flowered grasses, and their *floret*, which popularly passes for the seed (the seed proper being within it), is furnished with a bristle-like appendage or *awn*. In the Porcupine-Grass this is much longer than in any other northern species. The grass, in its general appearance, is much like an oat; indeed, in some western localities it is known as "Oat-grass," and "Wild-Oat." It bears a loose-few-flowered cluster, each flower of which presents a most beautiful contrivance for disseminating the ripe grain, but which, by often placing the grain where it is not wanted, causes the grass to be regarded with aversion. The engraving shows a floret and its appendages of real size and one enlarged. The floret proper consists of two chaffy scales closely inclosing the seed, the outer one enwrapping the other, and furnished below with a hard, bony point, the *callus*, as sharp as a needle; this, except at the very point, is clothed with stiff hairs, which allow the point to enter a substance, but act like barbs to prevent its withdrawal; less dense hairs upon the whole surface point in the same direction; this floret is from $^3/_4$ of to an inch long. At the top is the *awn*, from 4 to 7 inches long (the extreme end is omitted in the engraving), bent at right angles somewhat above the middle; that portion below the bend is closely twisted with a regular thread like a screw, and upon this are minute stiff hairs, each acting like a barb. Mr. Chas. L. Palmer, Clay Co., Minn., writes that: "These seeds are a regular pest to man and to animals; in walking over the prairie in summer, persons are tormented by them when and where they least suspect. Sheep and dogs are apt to be troubled by them, and in their rubbing and scratching in their endeavors to get them out only help the points to enter deeper into the solid flesh, and are sadly tormented. Cases are known in which horses have been dangerously wounded and even killed by these seeds entering the nostrils and penetrating to the breathing organs. In some places good grass is left unmown where this pest is common, and sheep cannot be safely pastured on such localities." Mr. P. gives a bit of his own experience: Last summer what appeared like a boil on his leg just above the ankle, and discharging slowly, disabled him for over a month; the case became alarming, as he was all the time in intense pain; at last, to his surprise, he discovered and drew out one of these seeds, the beard having broken off it was ejected by the suppuration, and recovery took place at once. He found that the boot he had worn had a rip just over the spot of the boil. The seeds have been known to enter the fleshy part of the leg and penetrate to the bone by working themselves forward. From these statements of Mr. P., and a knowledge of the plant itself, one can see the mischief it may work upon both men and animals without our having any suspicion as to the real cause. He states that it readily disappears before cultivation, and also where fire has run over the prairie. The grass is only capable of mischief when its seeds begin to mature. When young it is readily recognized by its long awn, and it should, if it is local, be mowed as a measure of safety.

THE PORCUPINE-GRASS. (*Stipa spartea.*)

Tying a Horse's Halter.

One is frequently obliged to tie a horse to a smooth post, and if the fastening is not properly done, the halter slips to the ground, and the horse is greatly inconvenienced, and may even become entangled in the halter and injured. Mr. "J. J. J.," Easton, Md., sends sketches of a form of halter knot, which he claims is easy to tie, and is perfectly secure. The knot is shown in figure 1; and is frequently used by sailors under the name of "clove hitch." To make this knot, the halter is taken in the left hand, with one's back to the horse and face to the post; pass the loose end around the post from right to left, bring it under the arm and carry it around the post above the other loop and pass it out under its own part and draw both ends tight. Take the loose end and pass it under the left arm and around the part attached to the horse, and down between the post and its own part. This knot, when drawn tight, is perfectly safe, even on a greased pole. Figure 2 shows the knot with the post removed. This knot can be made by slipping two loops (*o* upon *u*), as shown in figure 3, over the end of the post, and drawing them up tight.

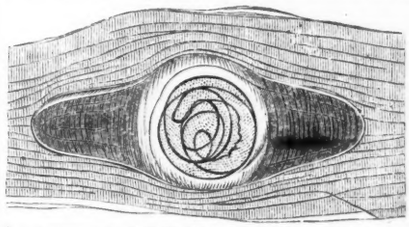
Fig. 1.—POST WITH KNOT.

Fig. 2.—THE KNOT.

Fig. 3.—THE LOOPS.

What are Trichines and Trichinosis?

The fact that some of the European governments have prohibited the admission into their countries of American pork, hams, etc., on account of "Trichines," has naturally led many to ask what are *Trichines*, and what is *Trichinosis*, so often mentioned of late in the foreign news in the daily papers. The *American Agriculturist* gave the first popular account of Trichines published in this country; this, however, was so long ago that the majority of farmers of the present time were boys when this was given. In view of the renewed interest in the subject, and to comply with the many requests, we give a brief outline of the matter. If one examines a piece of pork containing Trichines, he will notice that the flesh presents an unusual appearance, as if it contained vast numbers of little grains. An examination with a magnifier will show numerous little bodies, which taper at each end, among the fibres of the muscles, and within each of these bodies is a small dormant worm coiled up in a spiral form, as in figure 1. If a piece of such flesh be eaten, it is digested, and the inclosed worms are set free within the stomach of the person. The worm at once develops to its full size, which is about $^1/_{28}$th of an inch in length, and becomes sexual. It both produces its young alive, and from eggs, and is very prolific. The young worms, and very minute they are, pierce and pass through the walls of the stomach and intestines, and make their way to all parts of the body. When they have located themselves in the muscles, they become "encysted," or inclosed by a sort of membrane, or sac. In time this often becomes hardened by a deposit of lime, and, being white, is quite conspicuous. These minute cysts are about $^1/_{30}$th of an inch long, and $^1/_{100}$th of an inch broad, and contain the worm coiled in a spiral. Being in size hair-like, its name *Trichina* is formed from the Greek word for "hair," and its specific name *spiralis*, refers to its manner of coiling when dormant. It is estimated that a cubic inch of flesh may contain over 80,000 of these cysts. It may be readily imagined that these myriads of minute worms, in piercing the stomach and intes-



1.—A TRICHINE COILED IN THE MUSCLE (ENLARGED).

Fig. 2.—OLDER STATE OF TRICHINE (HIGHLY MAGNIFIED).

tines, and making their passage throughout the muscles of the body, must cause great pain, and the presence of all these foreign bodies in the muscles produce serious illness. The disease caused by them is called *Trichinosis*, and sometimes *Trichiniasis*, and is most frequently fatal. If the patient recovers, he carries the encysted trichines in his muscles through life. This parasite is brought into the human body only by the eating of infested pork, and it will naturally be asked how it gets into the system of the pig. Of those Trichines which are liberated in the human stomach after eating infested pork, only a portion of them reproduce in the human body, but many pass out of the system with the evacuations. Those that are thus liberated wander about on the grass and other plants, and some of them are finally taken up by the swine. When once within the body of the pig, they multiply rapidly, and the animal's flesh becomes filled with encysted trichines, which remain dormant until they find themselves in the human stomach. Practically there is little or no danger from trichines if pork be thoroughly cooked. The cases, in this country, at least, have all been traced to the European custom of eating uncooked ham, sausage, etc. Thorough cooking, not merely heating the outside of the meat, but cooking it through and through, makes the pork safe to eat, even if it should contain trichines. In some of the reports from abroad, Hog Cholera and Trichines are spoken of as if they were one and the same. The two have no relation to one another.

It is but taking proper precaution to examine not only fresh, but every form of pork before cooking, as salting does not kill the worms. If any trichines are present, they will be in the lean portion; an ordinary magnifier or hand-glass will show the cysts, and if present, the meat should be rejected.

Mending a Fork Handle.

A young reader, eleven years old, Amos J. Eaton, Orleans Co., Vt., sends a sketch and description of a method of mending a fork handle that may be of service to many older readers. The handle to a dung fork being broken, it was made whole again thus: The upper part of an old castaway shovel-handle was sawed off at the right length to fit the portion of the fork handle below the break. Two ferrules were put on the ends, and a hole bored down the center of each end, so that an iron rod, 6 inches long, with threads upon it, was screwed in. This bolt, with the ferrules, makes a perfect job of mending, and the fork works as well as would a new one, while the cost is almost nothing.

Many similar accidents occur upon the farm, which a little tact in mending will

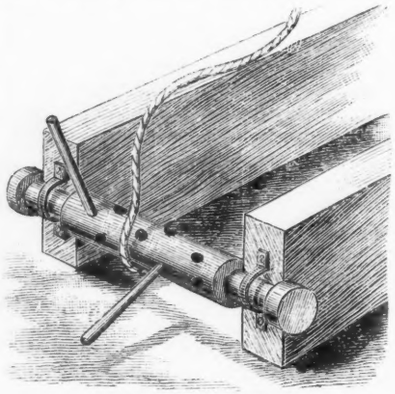
MANNER OF MENDING A FORK HANDLE.

remedy, and besides save the time and trouble of running off to a distant blacksmith shop, or the expense of buying of a new tool.

Mutton to Feed Dogs.—A number of inquiries have come of late as to the adaptability of several of the older States to the raising of sheep. There is a question that takes precedence of those relating to soil, climate, etc., which is, the dog laws. Unless the State has a law that will protect the sheep-owner, and make the township or county responsible for the sheep killed by dogs, don't go there. There is many a sheep-raiser's paradise left unoccupied, because of the curs, of which the poorer a man is, the more he owns. No one can afford to raise mutton to feed worthless curs, and that is what sheep-raising amounts to where these brutes are abundant and left to run untaxed, and the sheep owner has no redress.

A Hay Binder.

The engraving here given is of a Hay Binder made, and in use, by Dr. William

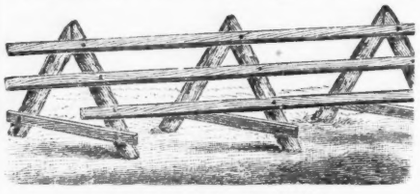


A WINDLASS HAY BINDER.

Armitage, Fort Atkinson, Wis. He writes: "The windlass is made of a round stick of hard-wood, about 5 inches in diameter, and works in two half rings, fastened in the rear ends of the bed pieces of the rack. The rope is fastened to the front end of the rack, then carried over the load and made fast to the center of the windlass. By the aid of stakes the windlass is turned until the rope is sufficiently tight, and is held so by the stakes pressing against the load of hay. The whole construction of the Hay Binder is easily understood from the engraving given above.

A Canada Portable Fence.

Mr. Leavitt Burnham, Douglas Co., Neb.,



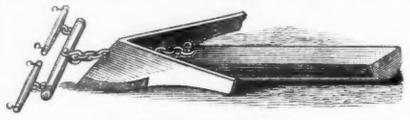
A CANADIAN PORTABLE FENCE.

describes a portable fence which he found in very frequent use in Canada. Its construction is plainly shown in the accompanying engraving, made from a drawing sent by Mr. B. It is not so light and easily moved as some portable fences that have been given in the *American Agriculturist*, but in localities like Canada, where timber is not scarce, this form is cheap, durable, convenient, and effective.

The Improvement of Corn.—This is, over most of the country, the month of corn planting, and now is the time to look to the improvement of this great cereal grain. No crop in the United States has greater possibilities, and none is grown at the present time with less care for the increase of its value. The average yield is not far from 40 bushels per acre, while the best possible crop, with the best seed, under proper culture, is not far from 200 bushels. With the hills 3½ feet apart, giving 3,555 hills to the acre, and four ears to each hill—the ears averaging 100 to a bushel of shelled corn—we should have about 140 bushels per acre. Looked at in this way, this yield does not seem great for each hill. But how are these large crops to be obtained. Aside from the soil, which should be rich and free from weeds, the seed should be of the best kind. At present there are too many barren stalks in every corn field. All such stalks should be cut out before they have time to shed their pollen and reproduce their kind. "Like produces like," and only the best should be allowed to reproduce; therefore save seed from the most prolific stalks, those the most desirable in size, shape, etc. One great point in improving the corn crop is to carefully select the seed from prolific stalks, that have through a series of years yielded more than one ear to the plant. It is safe to say that a proper attention to the selection of seed will double this valuable crop on every corn-growing farm.

A Home-Made Ditcher.

A single postal card sometimes brings us as valuable matter as a long letter. This is illustrated by a postal from Mr. Charles Warren, Ashtabula Co., Ohio, which has a neat drawing of a home-made Ditcher on one end and a description filling the rest of the card. The sketch is reproduced in the engraving. Mr. W. writes: "This is a handy ditch opener for wheat ground or any other crop, the



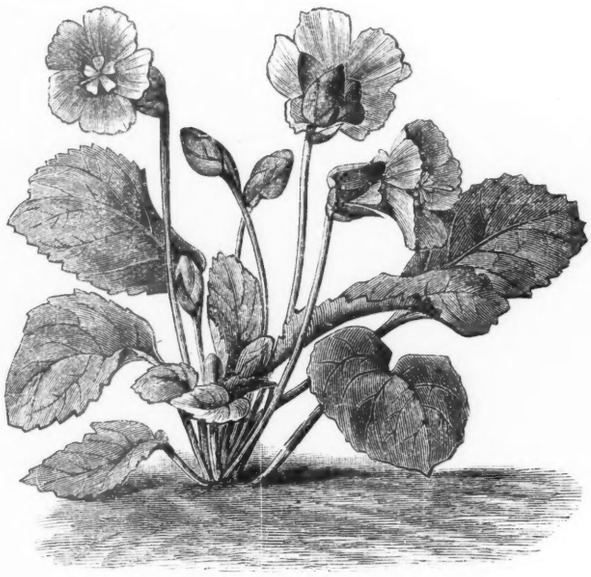
A HOME-MADE DITCHER.

ground of which needs to have open ditches made through it for the drawing off of an excess of surface water. The bed of the Ditcher is made of a slab about 4 feet long, 16 inches wide, and 4 inches thick. The wings are made of 1¼-inch plank, 3 feet long, and 1 foot wide." The point needs an iron plate to protect the wood. A hole is bored in the front of the wings through which the draft-chain passes, and is fastened to an iron spike driven in the top of the bed piece. The man driving the team can stand on the central portion of the bed piece, unless he is unusually heavy or the soil is very mellow.

Reddening of Salted Cod-Fish.—A peculiar redness often makes its appearance on salted codfish during warm and damp weather in summer. Dealers and consumers sometimes suffer considerably from this, as it causes the fish to putrify and become worthless. The cause of the reddening has long been a subject of conjecture, but is now ascertained. Professor Farlow, of Harvard University, finds on microscopic examination that the redness is due to a minute sea plant (Alga), consisting of single cells—like the yeast plant—which are filled with red coloring matter, and encased in a mass of slime. It does not flourish when the temperature is below 65° F.; therefore storing the fish in a cool place is a preventive.

The Rarest of Native Plants—Shortia.

Probably no other native plant has been the object of so much search, or has had its existence surrounded by so much doubt, as Shortia. In the year 1839, Prof. Asa Gray, in examining the herbarium of the elder Michaux, at the Paris Museum, came across a specimen collected by that eminent French botanist in the mountains of North Carolina, now about a hundred years ago. Though the specimen had lost both petals and stamens, Doctor Gray at once saw that it was unlike any other American plant, and described it as the type of a new genus, *Shortia*. The name was given in honor of the late Doctor C. W. Short, of Louisville, Kentucky, an accomplished botanist, and one who did much by his wealth for the promotion of the science.



A RARE NATIVE PLANT (*Shortia galacifolia*).

In 1841 Doctor Gray and two other botanists made an extended tour through the mountains of North Carolina, mainly for the purpose of finding Shortia, and at intervals other botanists have since followed Michaux's trail, searching for the same plant. Their lack of success was so uniform that it began to be feared that there was some mistake about Michaux's specimen, which might not have come from America after all. But the genus turned up in 1868—not in North Carolina, but in Japan, where a plant was discovered agreeing with the description of the genus *Shortia*, but a different species. At last, in 1877, Mr. G. M. Hyams had the good fortune to discover the long sought Shortia in McDowell Co., N. C., and in 1879, Doctor Gray and a number of other botanists made an excursion to Mr. Hyams' locality. This most interesting spot, which was a space of only about 10 by 30 feet contained from 50 to 100 of the plants which had been the object of so much search. There are a few other instances of a plant being confined to a single limited area, but we think none where the whole known stock is restricted to quite so small a station. There are hopes that other localities may yet be found for it, though it may be that the plant, in the "struggle for existence," has here found its "last ditch," where it is making a stand, but may shortly disappear altogether. A few specimens having found their way to the collection of hardy plants of Woolson & Co., Passaic, N. J., its flowering in a cold-house this spring allows us to present an engraving of the novelty, which appears likely to add another to the list of alpine plants desirable for cultivation. The origin of the generic name, *Shortia*, has already been given; its specific name is *galacifolia*, from the resemblance of its leaves to those of *Galax*, a related plant. It belongs in the small Diapensia Family, and related on one side to the Heath, and on the other to the Primrose Families. The plant has a creeping root-stock, from which arise tufts of evergreen leaves, of the form shown in the engraving. The flower stalks appear from among the leaves, each bearing a single pure white flower, which is, when fully expanded, an inch across; the petals are somewhat fringed or irregularly scolloped at the margin, and marked with semi-transparent veins. This is not the place in which to give the minute structure which distinguishes the plant botanically. As a general thing, botanical varieties are not often attractive horticulturally, but *Shortia* is an exception. We trust that this interesting little native, after so long eluding civilization, may kindly submit to cultivation, and in proper localities become at home in our grounds.

The Box-Leaved Milkwort.

The Milkworts—*Polygalas*, are rather a large genus, there being, the world over, more than 200 species. Of these we have, in North America, over 30, but they are for the most part not so showy as to be well known. Perhaps the best known is one of the least conspicuous, *Polygala Senega*, which, from furnishing the drug, "Seneca Snake-Root," has been nearly exterminated in most of the older States by the root and herb gatherer. Those who study our native plants know that the genus presents much that is interesting, and they find in the "Fringed Polygala," *P. paucifolia*, of northern woods and along the southern mountains, one which, though small, is among our most beautiful native flowers. Some of the evergreen shrubby species from the Cape of Good Hope are showy greenhouse plants. The species here figured is a dwarf shrub that comes from the Alps of Switzerland and other mountainous parts of Europe. In its wild state it varies greatly with the soil and situation, being often not more than two inches high, but in cultivation in favorable conditions it is a foot or more in hight. Being an evergreen, it can only succeed with us in a partly shaded, moist locality, and when this can be given, it is a most desirable plant, being perfectly hardy, so far as cold is concerned, but to succeed, its foliage must not be exposed to our midsummer sun. To grow at the foot of a rockwork, or at the front of a shrubbery border, it is very useful, as it is in flower for a long time, and when not in bloom its dark-green, box-like, foliage is pleasing. The engraving gives the leaves and flowers of the real size. The flowers have a peculiar quaint form, and show a pleasing combination of delicate yellow and pink. The fragrance of the flowers is very distinct, and has been compared, among other things, to that of ripe apricots. Wherever it will flourish it will be found most useful for forcing. The plant from which the drawing was made was potted last fall, and in a cool house, indeed, so cold that it sometimes froze; it came into flower in February, and remained in perfection for a long time. Like other plants that form dense tufts, this is easily multiplied by division of the clumps.

THE BOX-LEAVED MILKWORT.

Transplanting Laurels.—Few shrubs are more beautiful than our native Mountain Laurel, *Kalmia latifolia*, and the desire to have it in the garden is very general. The many unsuccessful attempts at removing it from its wild localities have given rise to the

general belief that it can not be transplanted. We have known expensive preparation of the soil to be made, and Laurels brought from only a short distance planted in it; they dwindled and died as soon as those planted without preparation, yet no shrub is easier to transplant, and it needs no coddling as to soil, though perhaps, like its brother, the Rhododendron, it dislikes a lime-stone one. In taking up the Laurel, it is easy to bring away a good clump of earth at the roots, and if the distance requires, this should be surrounded by a mat or some hay to prevent drying. Then remove from the plant *every leaf;* the leaves are in clusters near the ends of the branches; with the scissors cut every stem and branch just below the leaves, so that nothing but a cluster of bare sticks remains. Plant this unpromising looking object in good garden soil, and next autumn it will be clothed with its beautiful foliage. Soon after planting the dry sticks will "break," and the buds will push in abundance all along the stems to form new leafy branches. We have seen many Laurels thus treated, and without a failure.

The Bidwell Strawberry.

BY E. P. ROE.

[As the spring catalogues of the dealers in small fruits have come to hand, one noticeable feature in them is the conspicuous place given to the Bidwell Strawberry. Knowing that this variety had been tested by Mr. E. P. Roe, we requested him to give us his opinion of it, to accompany an engraving from a sketch made upon his place. Mr. R. suggests that an article from him might appear as if he had "an axe to grind," concerning which we agree with what he here says.—EDS.]

THE BIDWELL STRAWBERRY (NATURAL SIZE).

So far from affecting any disinterestedness, I admit frankly that I have "an axe to grind," but I propose to do all the grinding in broad daylight. I have invested largely in the "Bidwell" because I believe in it. I shall plant it more largely than all other kinds put together, and for this reason. It is my custom to test every new variety that appears. Among hundreds that I have tried, the Bidwell for two years past has taken the lead on my place. I ask if, in your opinion, I should hide such a strawberry-light under a bushel, merely because I deal in the plants? Cannot a nurseryman deal so frankly and squarely with the public that his "axe-grinding" may be as conducive to the interests of others as to his own? I also invested largely in the "Crystal City" and "Marvin," and have, I suppose, 100,000 plants of these two varieties on hand. The former I do not recommend at all, except for the amateur who wishes a few exceedingly early berries. The latter is a fine large firm berry, but I do not advise any to plant it who has not a soil that will raise the "Jucunda" profitably. But few fruit-growers have the time or the means to try new things, but all are eager to learn the results of such tests. If one will keep an honest record, and give the bottom facts, no matter whom they hurt, may he not do it even though a plant-grower? It is my belief that there is a fine future before the "Bidwell" Strawberry, for, like the "Cuthbert" Raspberry, it has made its way to the front by its own merit. It is not a strictly guarded novelty that was highly lauded before being sent out. I enclose you the endorsement of so thorough a horticulturist as Mr. T. T. Lyon, of Michigan, in which State the variety originated. It has done admirably on Mr. Force's place, in Newburgh, and Mr. Lovett's, in N. J., as well as upon my own grounds. Mr. Peter B. Mead saw my plants in bearing last summer, and writes: "But to the 'Bidwell.' I was greatly pleased with it, as I saw it growing in your grounds. The fruit was large, of good color, and had a peculiarly grateful flavor, reminding me, at the time, of a well ripened Black Tartarian Cherry. I can remember no strawberry with so distinctive a flavor. Then, too, the plants were very productive. I hope it may do equally well everywhere, for it seemed to me at the time to be one of the most promising strawberries I had seen in a long time. It was also very fine at Mr. Force's. My own plants are growing finely." I state distinctly that it is a novelty, just as the "Chas. Downing" and "Champion" were a few years ago, and like those standards must endure the test of years in all localities and upon all soils before its real value can be permanently known. That it "thrives on light soils," and that not a leaf burned or scalded during the prolonged heats and drouths of last summer, are facts that signify a great deal to an experienced fruit-grower. I shall fruit it quite extensively this summer, and I here invite all of the fruit critics to come and see and test it.

The Chayote, or Chocho.

Comets are not the only things that move in irregular orbits. An Agricultural Editor may be sure that certain things will turn up at intervals, which may be subject to some law. One of those things that, from one source or another, is sure to be presented to us

THE CHAYOTE OR CHOCHO (*Sechium edule*).

every few years, is the "Chocho," or "Chayote," the first is its Spanish name, and the other that by which it is known to the English-speaking residents of the West Indies. The thing, as presented to us, is a more or less irregularly pear-shaped, wrinkled fruit, though it looks quite as much like a root as a fruit. The last one received came from a seedsman in a neighboring city, for a name, and was in just the condition to show its striking peculiarity, and we give an engraving of it. The article in question is the *fruit* of one of the Squash Family, the botanical name of the plant being *Sechium edule*. The vine is much like that of a melon, and the fruit is of the general shape shown in the engraving, which is about half the real size. The fruit is really a one-seeded squash, or melon. It is of a creamy-white color, and furnished with numerons weak prickles. It has within just *a single large seed*, and when germination begins, the fruit breaks at the top, the seed protrudes from the crack, and the vine shoots begin to grow from the seed as shown in the engraving. Some years ago we were presented with one of the fruits that had been started in a pot. In order to give it a good chance it was planted near the pigpen. The vine grew famously, and soon draped the pen in a manner no doubt most agreeable to the inmates; it then took a start for the fence, and went through that into a neighbor's grounds, running eastward at a rapid rate. Where it would have gone had not frost checked its career, we cannot say, but with all its growing it showed no signs of fruit. In tropical climates it is said to bear fruit abundantly, and, moreover, to bear at its roots edible tubers. The fruit is used after the manner of the squash, and is said to be much esteemed in warm countries. It has been introduced into our Southern States, and is said to be offered in the markets of Mobile and other

southern cities. From our experience with it, we judge that it will be of no use in the open ground in northern localities. The fruit is sent from Maderia to London, and should it be desirable, it might readily be sent from our Southern States, but thus far we have not had a chance to thoroughly test its quality.

The Time for Pruning Evergreens.

Many of our readers can remember when no one thought of pruning an Evergreen with the view of bringing it into shape, save to cut away the lower limbs, and bring it out of all decent shape. By evergreens, we now refer to the cone-bearing trees, and not to hollies, rhododendrons, and other broad-leaved evergreens. Several recent letters ask the proper time for pruning these trees. A more important question should take precedence of, and also decide that—namely—"Why prune at all?" No one should cut a branch, large or small, evergreen or deciduous, without having a clear idea of what he does it for. Pruning may be done to accomplish the most opposite ends. We may prune to promote growth of limb, or we may prune to check the growth, and so on. Let us say, in the first place, whatever else is done to an evergreen, do not cut it away below. Left to themselves, these trees form pyramids of verdure of the greatest beauty. A tree with its broad base resting upon the ground, and tapering gracefully upwards, is a most pleasing object, and gratifying in its symmetry and apparent stability to every person of taste. Cut away the lower limbs, leaving a naked trunk of 6 or 8 feet, and all beauty and symmetry are destroyed, and we have an object as graceless as a hay-cock upon a gate-post, a horticultural horror. This treatment is often excused by the plea that the trees were at first planted too closely, and now light and air are shut out, hence this cutting away of the lower branches. We admit the necessity for light and air, but have seen no case of close planting which might not be better remedied by taking out a portion of the trees altogether, than to mutilate all by removing the lower branches. If trees are too near the house, either remove or cut them down—but do not cut them *up*. There is no proper time for pruning of this kind. If a tree grows one-sided, or irregularly, and it is desired to have an increased growth at any point, the proper way to secure this is to cut the branches back to induce a new growth to push vigorously. Pruning for this purpose should be done when the season of growth is well matured in early autumn. If the irregularity is due to an excess of growth, and it is necessary to repress this, then the proper time to do it is immediately after the growth in length has been completed, but before the wood has become hardened and matured. Much may often be done to improve the form of a tree, and fill out their places by bending some of the branches and tying them in the proper position, taking care that the ligatures are no where so tight as to check the enlargement of the branches. If held thus for a few years, they will retain their position. The pruning of evergreen hedges is governed by the same rules. In the first years of a hedge, we wish it to grow as quickly as may be to the required hight, therefore if the growth can any where be encouraged by cutting back, it is to be done in early autumn. In the climate of New York, October is the proper time. When the hedge is as high and broad as desired, we then wish to repress further growth, and the main pruning is done so soon as the spring's growth has been made, but while the shoots are still tender. Cutting in that state tends to check the growth. In localities similar in climate to New York, June is the month for this, which, in an established hedge, is the most important pruning, that performed in the fall being merely to correct and preserve the shape. In cutting all horizontal branches, half an inch or more in diameter, make a sloping cut on the underside of the branch, so that in looking down upon it, the wound is not seen.

Zinc Labels.

Sheet zinc, from its indestructibility, and the ease with which it may be cut and managed, is a favorite material for tree and shrub labels. If cut in the form of a very long tapering wedge, the smaller portion may be coiled around a twig, or small branch, and thus avoid the use of a wire, and where the small end of the label is coiled around a small branch, it will yield to the increase of that in size, and not cause strangulation. The old method with zinc labels was to write upon them with an ink made of some salt of copper, and several have asked for the formula for preparing it. The original ink was made with Verdigris and Sal-ammoniac, of each 2 drams, Lamp-black 1 dram, Water 4 oz. As these need to be well rubbed together, it will be as well to let the apothecary mix them in a mortar. This is to be used with a quill pen upon the surface of zinc that has been made clean and bright by the use of emery paper. We have been informed by our correspondent "Horticola" that a strong solution of Sulphate of Copper—"Blue Vitriol," or "Blue-stone," will answer the same purpose, adding a little gum water to the solution, if need be, to prevent the ink from spreading. The use of the lamp-black in the ink first mentioned, is only to make the ink visible while writing with it. In both these cases, the copper is, by chemical action, deposited upon the zinc, and, becoming oxidized, makes a permanent and conspicuous writing. Another and much simpler method is simply to write upon a clean zinc surface with a common lead pencil. By the action of the air the zinc becomes tarnished and grayish, while the black lead prevents any such change where the writing is, and though not so conspicuous as that written with the ink, is quite as permanent, and being much less trouble is preferable.

Substitute for Pea Brush.—Of all the devices for training peas without brush, by far the most satisfactory of the many we have tried, is that suggested by Mr. Z. Mills, Jr., in our pages for May, 1878. Round, or half-round, posts, six inches in diameter, are firmly set at each end of the row. Galvanized iron-wire, No. 18 is used, taking a turn around the posts, thus making two parallel wires six inches apart. Two of these wires are put on when the peas are about six inches high, or before they fall over. When the vines reach 6 or 8 inches above the first pair of wires—or when they seem to need it, two more wires are put on, and so on. If the rows are very long, some support by stakes or laths may be given; with our own rows of 200 feet, one support in the center was found to be sufficient. With care in using them, the wire and posts will last for several years.

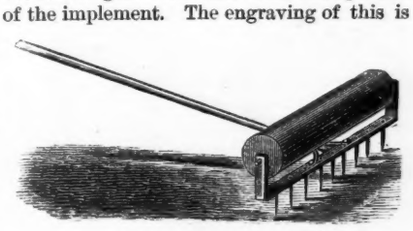
Some Garden Helps.

Reel for the Garden Line.—Straight work, in the garden, the laying out of beds, the proper alignement of rows and blocks, if possible without a line, are greatly facilitated by one, and the convenience in using depends largely upon the kind of reel. Those usually sold have been, for years, so worthless that we have sometimes preferred to use a couple of sharp-pointed sticks to being annoyed with the inefficient old iron. We have given several engravings for reels, both of wood and iron, some of which could be home-made. We now give another, sent by Mr. J. Stewart, of Allegheny Co., Pa., which will serve as a guide to the blacksmith. The center-post or stake of the reel is of $^5/_8$-inch round iron; the reel proper, or the part which carries the line, is made in one piece of iron an inch

REEL FOR THE GARDEN LINE.

wide by $^1/_8$-inch thick. A large eye is formed in which to place the ball of the foot, and force the stake into the ground; just above this a washer is shrunken on, upon which the reel revolves. The pin for the end of the line is provided with an eye like that on the shaft.

A Rake and Roller, for use in hot-beds and other seed-beds, is made from a malleable-iron rake. Two teeth are taken out of each end, and a roller of hard-wood, with an iron pin in each end is provided. One end of the back being turned up at right angles, one of the pins of the roller is placed in the uppermost hole, and the roller secured by turning up the other end to engage the other pin as seen in the engraving. A handle of convenient length is attached to the rake portion of the implement. The engraving of this is



GARDEN RAKE AND ROLLER.

also from a drawing by Mr. Stewart, who writes that he finds it very convenient in seed sowing. Labor-saving devices like these are of great value to every person who desires to have a neat and profitable garden.

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

Oyster-Can "Pigeon Holes."

A place for small articles such as letters, valuable papers, seeds, etc., is very important in every house. Such small places of safety are called "pigeon holes," and are usually made of thin boards, dovetailed or otherwise fastened together. Mr. R. Z. Fahs, Jersey Co., Ill., sends drawings of a case of "pigeon holes," which he has made of old oyster cans—the square kind—usually found in great numbers about hotels, restaurants, and some dwellings in the interior portions of the country. The cans being thoroughly washed, the end of each is melted out and the edges hammered down and smoothed with a file. Figure 1 shows a bracket shelf with a rack beneath, upon which a number of these cans are placed side by side. The shelf may be arranged for the cans to have the open end in front, so that the contents may be taken out or put in without moving the can. Some may prefer to have the open end at the top, when each can must be taken out as the contents are wanted. Labels, as "Letters," "Circulars," etc., may be put on the cans as desired. Mr. F. has arranged one side of his book-case as shown in figure 2. A thin strip is nailed to the side—the width of the cans from the book-case—and in this space a number of the cans are placed, one over the other, with the open end outward. A case devoted entirely to cans may be made as shown in figure 3. Such a case need not be heavy, and may be put against the wall as a bracket, or placed on the rear of a stand or table. Oyster cans of the square kind arranged in any of the ways here suggested will be found very convenient, and the cheapness should recommend these "pigeon holes" to every one having papers and other small articles to preserve for ready reference.

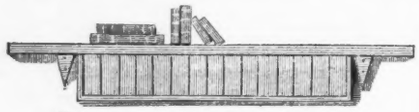


Fig. 1.—A "PIGEON-HOLE" BRACKET.

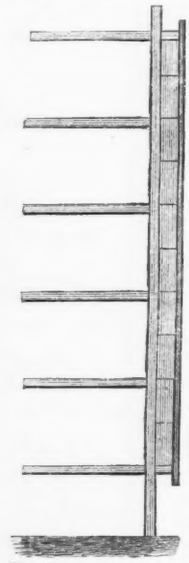


Fig. 2.—CANS BY SIDE OF BOOK CASE.

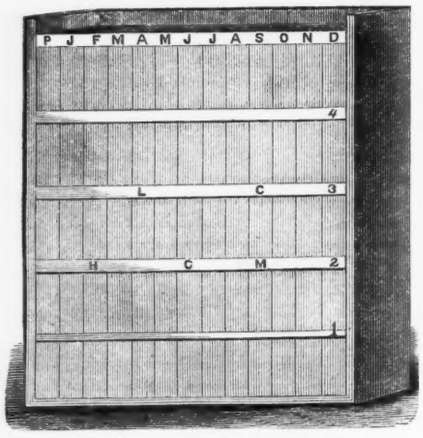


Fig. 3.—A CASE OF OYSTER CANS.

Home Topics.

BY FAITH ROCHESTER.

Eating Between Meals.

This habit should always be discouraged. Three regular meals are enough for almost every one. I cannot think of any case where a person of average health, or a child old enough to talk plain, can habitually need more frequent meals, if these three are of good wholesome food. Eating lunches between meals is a habit easily acquired, but troublesome and unhealthful. To keep little children from acquiring this habit, see that they have plenty to eat at their regular meals—plenty of good, nourishing food. Many seem to suppose that if the stomach is filled with something at a meal, especially if that something be made to "taste good," it matters little what the filling may be. People speak of an empty stomach as the one great evil in case of delay about meals. Genuine hunger is the real need of the body for more building material. Hunger is often fancied (more often than genuine hunger is felt) by those who have plenty, because there is a sense of emptiness in the stomach which is kept so constantly filled as to have little chance for rest. My baby's case convinces me that eating between meals is mostly a mere habit. He has always been well nourished. I found that he was more contented and slept better at night when he had good full meals—mostly sifted Graham gruel and milk, or bread and milk, after weaning, for a few months—and he always expected to finish his meal before he turned to anything else. Before he was a year and a half old it was quite noticeable that he hardly ever wished for anything between meals, even when others around him were eating. Some who had a theory that children should eat little and often, felt sure that he ought to have something between meals; but if they can show me a stronger, plumper (not *fat*), or more rosy-cheeked, healthy fellow of two years, I should like to see him.

Children's Under-garments.

I do not know why so many people imagine that little boys need less clothing in cool summer weather than girls do. Mothers who would never think of allowing little girls to go with only one thickness of cotton over most of the body, let little boys go through the cool summer mornings and evenings, and through those days when they put thick clothing on themselves, with nothing under their unlined cotton trousers, perhaps with no clothing on except a waist and trousers buttoned together. This is well enough on very hot days and nights, but all little boys ought to be provided with thick cotton underdrawers, a little shorter than their trousers, to wear all summer except in the hottest weather. Often it is advisable to put a second pair either of drawers or trousers, between the inside and outside layers of clothing, unless the thin trousers are exchanged for thicker. I have seen considerable of this neglect to provide children with sufficient clothing in summer, where there was no excuse except ignorance or carelessness.

For children of both sexes, the combined waist and drawers is the most convenient fashion for under-garments. In summer it is more convenient to have them made in two parts, buttoning together around the waist. I find it best to provide long-sleeved, high-necked, thick cotton waists for the spring and fall, and cool summer days, and other thinner ones with low neck and short sleeves for hot weather. This leaves no necessity for shirt or chemise, and at night a night-gown is the proper covering. It is best to take off all of the clothing worn during the day, and give it an airing at night.

I see patterns for children's waists in the pattern books. They cannot be so useful and healthful as the plain waist with sleeves either long or short. Whatever a woman must come to in the way of absurd and unreasonable clothing, let the little girls be as equally covered as possible.

The Use of Spices.

Opinions would differ about the real use of spices in our food. More than one family has learned to do without spices almost entirely. A little now and then is the general rule among enlightened people. Professional cooks and teachers of cookery caution us against too free a use of spices, if we would regard the health of our families. Ignorant cooks seem to think that if a little of anything is good, more must be better. It seems to me to be with spices as with perfumes—the use has been mainly to cover up something wrong. If good materials are used in cookery, especially good butter and sugar, there is no need felt for strong seasoning. But spices are said to be good for provoking an appetite. That shows that something is wrong with the one who eats. So far as I have observed, a healthy person who eats regularly and temperately of plain and nourishing fare, has no need of a special appetizer. He cannot help relishing good food well cooked, though plainly seasoned, if he has a suitable variety to supply his needs. If the appetite fails, better begin at the other end to mend matters. Try a little fasting, or greater moderation in eating.

A Mud Mat.—Next to dust, mud is the housewife's great trouble, and especially in the spring. It is impossible to prevent mud from getting upon the boots, and unless removed it will be carried into and distributed in larger or smaller quantities throughout the house. A mud mat and a scraper will do much to keep the mud out of the house, provided they are used. There should be one of each at every entrance door. A ready made scraper can be bought for a small sum at any hardware store, but for this there need be no outlay; a piece of old saw-blade, or even a bit of iron hoop can be so readily converted into a scraper that it needs no illustration. The scraper is for the purpose of removing mud, etc., from the boot or shoe; the important points to be observed are: to put it in a convenient place for use, and where the mud that is removed will fall in a place where it will be out of the way, and not be taken up again by those who enter the house. A mat for the removal of the coarser mud from the boots and shoes can be readily made as follows: Procure a number—20 or so—of inch-square fence pickets, and bore four holes through each, one near each end, and two between. String these on four stout wires,

keeping the strips an inch apart, by alternating short square pieces of wood upon the wires. Fasten the ends of the wires when the mat is made as wide as desired, and it is ready for use. A very useful mud mat may be made from a piece of plank of convenient size, in which inch or inch and a half holes are bored. Into these holes are placed tufts of corn husks made tight, by driving in pegs with them. A mat of this kind will cost nothing, and last long. If all persons who have muddy boots will first scrape them, and next use the mud mat, and afterwards the ordinary door mat, much mud will be kept out of the house, and the labors of the neat housewife will be thereby greatly lessened.

Our Rural Improvement Society.

Of course we believe in "Rural Improvement Societies," for did we not several years ago record the work of one of the very first and most successful of them, and thus incite the forming of others? When we read that the inhabitants of this or that village have formed a "Rural Improvement Society," have chosen officers and are going to work at once, we rejoice. We know that it means for that locality, street trees, passable roads, well kept front yards, and many other improvements that most villages need. But all of our readers do not live in villages; and our farmers are generally too far apart for this concert of action. Yet farmers need the work of an improvement society quite as much as villagers; hence we propose "*Our* Rural Improvement Society," intended especially for every reader of the *American Agriculturist*, who lives upon a farm, though those who have the misfortunes to live in villages, towns, and cities, will not be excluded. Generally, in the press of farm work at this season, this "Society" must consist of *one* —and that one the wife and mother. All the better if we can have the father and husband, and better still if there are sons and daughters who can aid. But as things go on our farms, our "Society" will be a very compact body, having an executive committee of one, and she should have power to call in aid. This Society must be formed at the proper time, and that is, *now*. No time need be wasted, as is always the case in large bodies, in discussing the constitution and by-laws. For our Society, these may all be comprised in "I must, I can, I will," and it will always have a quorum, and need spend no time in the election of officers. Its great end and aim should be to organize itself now and get at work before hot weather comes upon us. Its organization being completed, what should be

The First Work of the Society?

If there is anything that gives an idea of refinement and comfort within the farm house, it is a neat approach to it, a well kept front yard. The Executive Committee of one, if it makes its first visit to the front yard, should pass right through it to the back yard and sit in consultation on the condition of the sink spout. It is delightful to have a veranda shaded by vines with fragrant flowers, but—where does your kitchen sink spout terminate? If horrid smells come from that spout, so much the better, as these may call attention to the matter. This being the weak spot in the arrangements of the majority of country houses—the disposal of the kitchen waste, it is the very first thing that should receive the attention of our "Rural Improvement Society." Ah! many a little coffin has gone out at the front door because the sink spout at the back door had been neglected. Unless physicians, chemists, and sanitary scientists are all wrong, sewer-gas—and the emanations from the sink on the farm are as much sewer-gas as those from the many sinks of a large city—is deadly. In building, whether the house is a log-cabin or one designed by a city architect, we find provision made for getting the kitchen waste water out of the house, and but very little care to taking it *away* from the house. A too common method is, to carry the waste water off for a few feet, to an open ditch, trusting that it will soak away there, and be thus disposed of. The ditch may end in a hole covered with boards, called a cess-pool. Both these depend upon the supposition that the waste water will soak away, be taken up by the earth of the ditch or cess-pool. But the trouble is that the thing will not work. Grease and other matters soon fill the earth and the ditch and the cess-pool, and in a short time they become water-tight. The waste water cannot soak away within this limited space. All that our Society can do at once to avoid danger from this sink drain, is to provide some means for the waste water to soak away under the surface. A few feet of ditch or a cess-pool the size of a flour barrel, will not answer for the waste water of a family. Carry the waste water away through drain tiles or wooden drains with holes in their sides. Provide means *at once* where all that enters the sink can run over into fields, meadows, or wherever it can go below the surface, and be soaked up as a temporary expedient. Get it away from the house at once, and then set about studying up and providing some permanent method of disposing of the house waste. We have placed the sink drain as the first thing for the consideration of our "Rural Improvement Society," but the privy is scarcely of less importance. There is but one way to improve the ordinary privy, with a vault, whether on the farm, or in a village or city, and that is to fill it up—be done with a vile thing that has no excuse for existing. Fill up the vault, and employ some one of the several methods we have given for making it useful as an Earth Closet. One of the first things that our Society should learn is the wonderful utility of *dry earth*. This does not mean sand, but good stiff loam made *not* merely so that it is not wet or damp, but *dry* —thoroughly dry—*dust dry*, and sifted through a coarse sieve to remove the lumps. Abolish every vault, and if the appended building will be convenient, then arrange a receptacle below the seat, of a kind that can be easily removed; put within the building a box of dry earth and a scoop; let every member of the family understand how it is to be used, and insist that it shall be used. The earth-closet will need to be emptied at intervals determined by the size of the closet, and the family using it. In no case should it be left until inconveniently full. One of the best ways is to use a stone-boat, and a box or barrel, drawing the contents to a compost heap or a distant field. Observe another point; no slops from the chambers are to go into the Earth Closet. The proper place for these is on the manure heap in the barn yard. We have one other point just now to which to call the attention of our "Rural Improvement Society," and that is *the well*. Most farm houses draw their water supply from a well. Whether the water is drawn by buckets or a pump of some kind, look to the top of the well. If the sink drain and privy have been attended to, all danger of infiltration through the soil from there is removed. There is still another source of danger, one not often thought of—that is, the inflow of water at the top of the well. This should always be guarded against when the well is made, but if there is the slightest danger that surface water can flow in during heavy rain storms, prevent it at once. What must be done will depend upon the location. Often a small ditch or surface-drain will carry surface water away from the well. If it is necessary to raise the surface around the mouth of the well, a moraine of coal ashes and loam, pounded down firmly, will serve as an expedient. If our "Rural Improvement Society" can, during the first months, reform the sink drain and the spring, and keep the well from the surface water, it will have made a most useful beginning.

A Clothes-Line Reel.

"C. C. W." writes: "I have been much pleased and benefited by the many timely hints and descriptions of handy appliances given to the readers of the *American Agriculturist*. I herewith send some drawings of

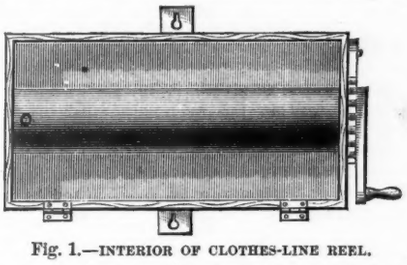


Fig. 1.—INTERIOR OF CLOTHES-LINE REEL.

a convenience which is both simple and handy. It is a cheap clothes-line reel. I had long coveted one of these, offered at the hardware stores, but being unable to buy, I set about making one. A box was procured from the store—a starch box well made—about 18 inches long by 8 inches wide and high. I paid a turner ten cents for a shaft about $1^1/_2$ inch in diameter, and the length of the box. A hole was cut in one end of the box the size of the shaft, the other end of the shaft coming up flush with the inside of the box and held in place by a large screw. The opposite end of the shaft has a ratchet wheel of wood, with a crank fastened to the shaft by two long screws. A pawl of wood engages the wheel and holds the line taut. There is a hole in one end of the shaft large enough for the line to pass through, it being fastened by a knot tied in one end. On the back is a strip one inch thick, 2 inches wide, and about 2 inches longer than the width of the box, with slots in the ends to hang the reel upon two large screws in the side of the house, or other convenient place. The cover is fastened on with two butts on the lower side, and turns down out of the way when the reel is used. The total cost of this handy device was 25 cents." The construction of the reel is given in figure 1, and figure 2 shows the ratchet wheel with the crank and the pawl.

Fig. 2.—CRANK AND PAWL.

BOYS & GIRLS' COLUMNS

The Doctor's Talks.

A few years ago a little was said in these talks about the hatching of the eggs of frogs and toads, from which tadpoles came, and the changes of these into frogs. Some of the youngsters have asked me to tell more about these. I do not wonder at your curiosity in this matter, for it allows us to see probably as much as we ever shall see of

The Very Beginning of Life.

It is a matter not merely gratifying to the curiosity of young folks, but is a subject that may occupy the most learned student. We see what seems to be shapeless matter, gradually take on form—to have parts or organs, to have a right side and a left, an upper and an under side. In time it moves and

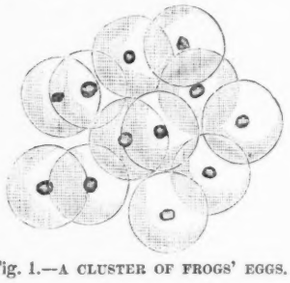


Fig. 1.—A CLUSTER OF FROGS' EGGS.

starts out with life, a new being that can see and feel, have wants and dislikes. It is to me all very wonderful. Just as I was thinking where I should be likely to find some frog's eggs, when spring should come, so that I might have material for drawings there came to me my monthly visitor from England, called "Science Gossip," and the first thing I saw upon opening it was an article by a Mr. Robson on this very subject. As it was the March number of the "Gossip" I thought English frogs must begin very early, but I found he was giving his last year's observations in time for those who would study the eggs this year. Here was a piece of good fortune, for while his talk was for old people, his drawings would answer for our young people, as English frogs hatch much in the same way that Yankee ones do. Indeed it makes little difference whether you find the eggs of either of the several kinds of frogs or toads. The changes are much the same. So the first thing is

To find the Eggs or Spawn.

This is not difficult for those who live in the country, but those who live in villages or cities must go to the outskirts where there are pools and ditches left by the spring rains, but will all be dry by mid-summer. Almost anywhere along the shallow margin of a ditch or pool, a little search will find the spawn. A naturalist, no matter whether he goes to collect "Potato Bugs" or Hippopotami, always, before starting, considers

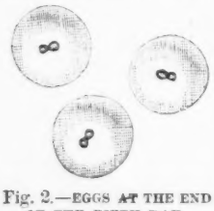


Fig. 2.—EGGS AT THE END OF THE FIFTH DAY.

His Necessary Outfit,

and success, even in hunting frog-spawn, depends upon starting right. You will go in damp places, therefore will need rubber or other water-tight shoes or boots. You will have something wet to bring home, and it will be well to take a small bottle with a wide mouth, or a little tin box, and if you have a tin lunch box or other tin box of that size or larger, take that with or without the others; put some bits of stiff brown paper into your pocket; if you have no knife to cut one, a small walking stick may be useful. If you have never seen any frog-spawn—for we will call it all frog, though some may be of the toad—you will want

To Know What to Look For.

The spawn floats just at the surface of the water, and may be in distinct strings, but more usually in a mass, as large as you can hold in your hand, or bigger. It is nearly transparent, looking like white of egg or clear tapioca jelly; through it will be large numbers of little black or darkish spots. A few eggs, 12 or 20, will answer your purpose as well as a quart. Indeed, you will, if there are but few, care for and watch them better; they will seem more precious than if you had hundreds. One of

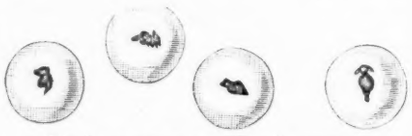


Fig. 3.—SIXTH DAY. Fig. 4.—EIGHTH DAY.

the first things a young naturalist should learn is, not to waste material. Regard each egg as if you had to learn all you could from that one and could get no other; by beginning in this way, when you get hold of something really rare, you will know how to make the most of it. What looks like a mass with specks through it, is really separate eggs, as in figure 1, each surrounded by a transparent membrane or bag, which represents the egg-shell. Separate a few eggs from the mass; don't be afraid to handle it (as it will not, as some boys say, "make you have warts"), and place in your vial or small tin box; if you have neither, make a horn of stiff paper and put the spawn into that. Now look about in the water for some

Fine-Leaved Water Plants,

selecting those that are the most delicate, and look as if they would continue to grow below the surface of the water. The stick is to help you to get these; if you find two or more kinds, take some of each; give them a rinse to remove any mud, and place them in your larger tin box, or if you have nothing else, take paper again. Now, having your spawn and your plants, get them home before they dry up. As to watch your eggs you wish to both look at them while they are in the water and to

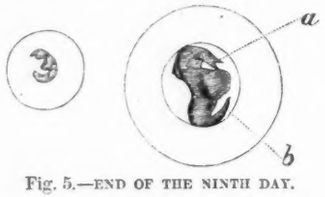


Fig. 5.—END OF THE NINTH DAY.

take them out when you please, a shallow dish will be better than a glass jar. A bowl or a more shallow dish will answer. Put in some rain-water, your young plants and your spawn; set the dish where it will have abundant light, in the window of a room where there is no fire. If the sun shines directly on the dish, shade it with a piece of paper, as you do not wish to cook the eggs. If you can cover the dish with a pane of glass all the better, as it will keep out the dust and check the evaporation of the water. You will need

Some Kind of a Magnifier.

You can learn a great deal without, but much more with one. The little "*Agriculturist's* Simple Microscope" will answer admirably, though the larger "Compound Microscope" will be better. These preparations are made that you may see these eggs, with no sign of life, gradually change and finally produce a living animal. It is well to have an idea of what we expect to see. The changes of our common frog's egg usually take

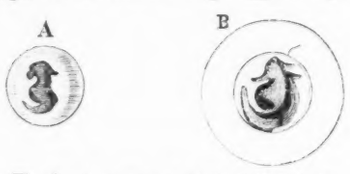


Fig. 6.—END OF THE FOURTEENTH DAY.

about a month from the time the spawn is laid until the living creature leaves it. The time is governed by the temperature, and it may vary with the different kinds of frogs. You should examine the eggs carefully at least daily, and be sure to

Make a Note of What You See.

The English eggs showed no change until the fifth day, when the central dot changed, and showed what is called "cleavage," as in figure 2. On the sixth day the shape was as in figure 3, and on the eighth day it appeared like figure 4. The condition on the ninth day is given in figure 5, in which both the real size of the egg is shown and the same magnified four times. Now the parts begin to show themselves; at *a* are the beginning of the gills, and at *b* the distinct tail. From this time onward changes were quite rapid. The 14th day's appearance is shown in figure 6, of the real size, and enlarged the same as before; the gills had grown very much, the nostril could be seen, and on this day, for the first time, motion was observed; the little creature bringing its head and tail together with a jerk. On the next day, the 15th, some of

Fig. 7.—TADPOLES OUT OF THE EGGS (15TH DAY).

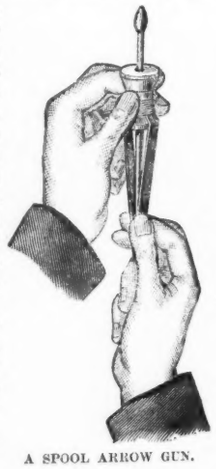
the little tadpoles were out of the egg, lying upon and eating some of the remains of the jelly-like mass. When the creatures first left the egg they were the size of the smaller one in figure 7, the other being magnified about three diameters. I suppose you all know that the first form of the frogs and toads is called a tadpole, and boys often call them pollywogs. On the 17th day the tadpole's external gills had increased much, as shown

Fig. 8.—TADPOLES ON THE SEVENTEENTH DAY.

in figure 8, where the view is seen looking down upon its back of one of real and of enlarged size. These gills, very much branched, are only to be seen when the tadpole is very young. In a week, more or less, according to the weather, these outer gills disappear, and then the animal breathes just as fishes do, by the aid of another set of gills.

A Spool Arrow Gun.

"J. W. H.," Mendocino Co., California, sends a sample of a toy for the benefit of the boys and girls. The materials required for this "gun" are a spool, a piece of India rubber, some strong thread, and one or more arrows. It is not a difficult matter for a boy to find an empty spool, and most families have suitable rubber that he can get. The strip of rubber is tied upon the spool in the position shown in the engraving. A straight piece of wood with a heavy blunt head makes the arrow. This is put through the center of the spool, the end brought against the rubber, and drawn back, when it is ready to fire. There is not much explanation necessary for this toy. From what has been said any boy will know how to make and use this gun. There are many careful persons who object to toy-guns and pistols, and to everything that will shoot; even including the bow and arrow. But it is the delight of a boy to have a toy with some "go" in it, and the sooner the boy learns all about a toy, the mischief it can do as well as the sport they can afford, the better. Boys should know that no form of gun is properly a house-toy, but should always be played with in the open air. In shooting with a toy-gun of any kind, have no random firing; always make sure that there is no one between the gun and the mark.

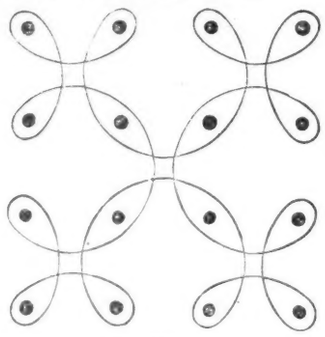


A SPOOL ARROW GUN.

Our Puzzle Box.

PLACES IN ASIA, CONCEALED.

1. I am hurrying to catch the noon train.
2. If you want to try your luck, now is the time.
3. I tried to borrow a little cash, merely for fun.
4. Lemonade never disagreed with me.
5. Don't be hypocritical; cant only disgusts one.
6. Well, then, I will sing an anthem.



ANSWER TO THE SIXTEEN POINT PUZZLE.

CROSS-WORD.

My first is country but not in state,
My next is in captain but not in mate,
My third is in whisper but not in speak,
My fourth is in dimple but not in cheek.
My fifth is in crumpet but not in bun,
My sixth is in abbess but not in nun,
My seventh is in lather but not in soap,
My eighth is in patience but not in hope,
My ninth is in chapter but not in verse,
My tenth is in patient but not in nurse,
My eleventh is in Hebrew but not in Greek,
My twelfth is in lowly but not in meek,
My thirteenth is in cellar but not in vault,
My whole is quite blameless and free from fault.

CONUNDRUMS BASED ON "WORD-MAKING."

(*Example:* Into what fabulous monster could you turn a certain vehicle, with the letter H? *Dray* into *hydra.*)

1. Into what animals could you turn some others with the letter Z?
2. How could you make a lad dutiful with the letter E?

EASY NUMERICAL ENIGMA.

1. I am composed of 9 letters:

My 1, 7, 9, is a bituminous carbon.
My 5, 9, 2, 7, 8, is precipitous.
My 3, 4, 7, is to prosecute.
My 5, 9, 2, 6, is to seethe.
My whole is a verse in the Bible.

MARIE BARBER.

ANAGRAMS.

1. O Sid gains,
2. I hurt sermon.
3. A cat's titles.
4. Only a duel.
5. The big end.
6. Ned, I bear it.
7. A keen Sam.
8. Visit lions.
9. I souse garlic.
10. Beans under a cup.

CURTAILMENTS.

1. Curtail a rover, and leave a bolting sieve for meal.
2. Curtail rank, and leave an animal.
3. Curtail the prevailing fashion, and leave a stone of coarse texture.
4. Curtail a dweller on the wild mountains, and leave the friend of your bosom.
5. Curtail an article of food, and leave a large number.

HENRY ALICE DONOGH.

SQUARE WORD.

1. A room or building.
2. A blessed sentiment.
3. Open.
4. Shut up.

RUSH S.

CHANGED HEADS.

Change my head several times and make (1) an unpleasant sensation, (2) a term of endearment, (3) a boundary, (4) a character in Shakspeare, (5) a fruit, (6) a period of time, (7) an animal, (8) left, (9) dry, (10) to give audience to, (11) a drop of fluid, (12) ornaments, (13), the fashion, and (14) the last class.

CHARADE.

My first is what each Englishman
Will sometimes say he is,
Unless he may be deaf and dumb,
Or something be amiss.

My next is found in every land
Where tree or herbage grows,
It sometimes may conceal a thief,
It sometimes bears a rose.

Ah! traveller, beware my whole!
Use well your ears and eyes,
Lest, all at once, your enemy
Should take you by surprise.

SCATTERED SQUARE.

(The letters for the first word must be taken from the first line of the stanza, the second word from the second line, the third word from the third line, and the fourth word from the fourth line.)

Swift upon its downy wing
The swallow skims the evening air,
And all the birds together sing
A pean to the day so fair.

DOUBLE ACROSTIC.

The initials, read upwards, give the transcendent name of certain foreigners.

The finals, read upwards, give the name of a railroad manager.

1. Intellectual constitution.
2. A plant dedicated to Apollo.
3. People who live on different sides of the equator.
4. To deposit sacredly.
5. One who rejoices for a victory.
6. Province.
7. Made eternal.
8. The puff-ball.
9. A Hebrew measure.
10. The first four letters of a word (of five) meaning a key.

HERA OLEA PHAROS.

PI.

Fi a nam anc eb paphy dan tednocent ni ish won nompacy eh liwl leglenray eb dogo paymonc rof throes.

Answers to Puzzles in the March Number.

DEFINITIONS.—1. Bower. 2. Deacon. 3. Elegant. 4. Gyral. 5. Grip. 6. Indict. 7. Parole. 8. Skill. 9. Tablet. 10. Flag.

NUMERICAL ENIGMA.—A boil in the kettle is worth two on the nose.

DECAPITATIONS.—1. Sash, ash. 2. Scream, cream. 3. Shatter, hatter. 4. Shoe, hoe. 5. Soil, oil. 6. Skin, kin. 7. Brook, rook.

ANAGRAMS.—1. Sustained. 2. Territorial. 3. Entwined. 4. Producers. 5. Corresponded. 6. Congratulate. 7. Instances. 8. Altercations. 9. Foregone. 10. Geometrical.

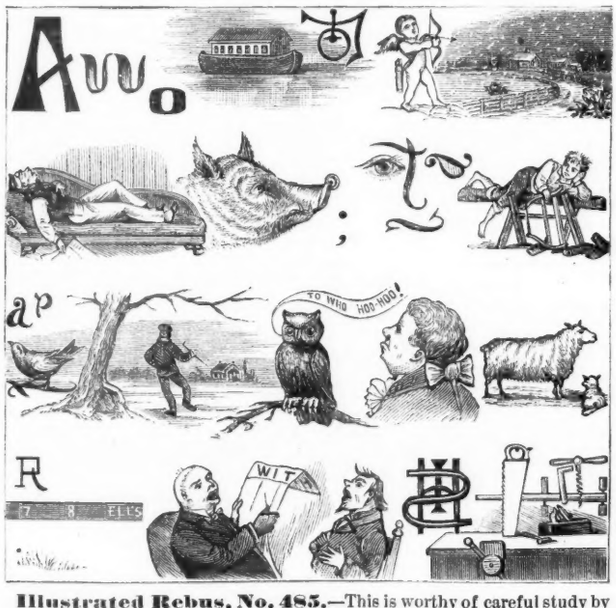
CROSS-WORD.—Toadstool.

ALPHABETICAL ARITHMETIC. — 2071)94685073(45719. (*Key.* One milk-pan).

PI.—It is a great mistake to set up our own standard of right and wrong, and judge people accordingly.

POSITIVES AND COMPARATIVES.—1. Sow, sour. 2. Coarse, courser. 3. Quote, quota. 4. Let, letter. 5. Mad, madder. 6. Wand, wander.

ILLUSTRATED REBUS, 483: Curtail your expenses and increase your income.



Illustrated Rebus, No. 485.—This is worthy of careful study by our friends, both for the amusement and for the good instruction it contains.

"How Does Coffee Grow?"

The youngster who asks this question need not apologize for it, as it is a very proper one. Don't be afraid to ask, for your questions are always welcome, and if we do not give an answer at once, there is a good reason for not doing so. Before answering *how* Coffee grows, let us see *where* it grows. If you were to visit one of the immense stores in New York where only coffee and tea are sold, you would see a great display of bags with large labels showing that they contain Java, Mocha,

Fig. 1.—LEAVES AND FLOWERS OF COFFEE (REDUCED).

Rio, Porto-Rico, Jamaica, Liberian, and other coffees. If you were to look up these countries on the map, you would find that they are all in the warmer parts of the globe. Indeed coffee cannot be cultivated where the average temperature is below 64 or 70 degrees. Left to itself the Coffee tree grows to the hight of 20 or 25 feet, but in cultivation it is kept less than 10 feet high, for the convenience of gathering the crop. It forms a handsome pyramid, with branches nearly reaching the ground. The leaves are evergreen and the flowers pure white, the shape of both being shown in figure 1, while figure 2 shows a flower of the real size, *d*. The flower is deliciously fragrant, and when it drops it is followed by a fruit the size of a small cherry, which becomes red as it matures, and when quite ripe is of a rich reddish brown color. On account of the fragrance of its flowers and its beauty when in fruit, the Coffee tree is often cultivated in our greenhouses, where it is always

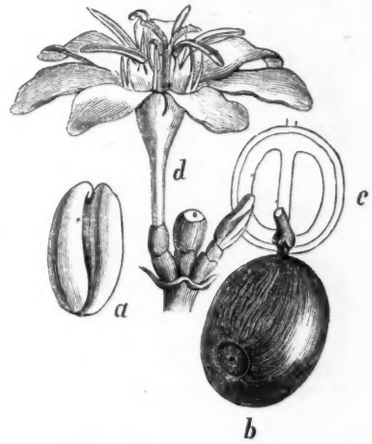
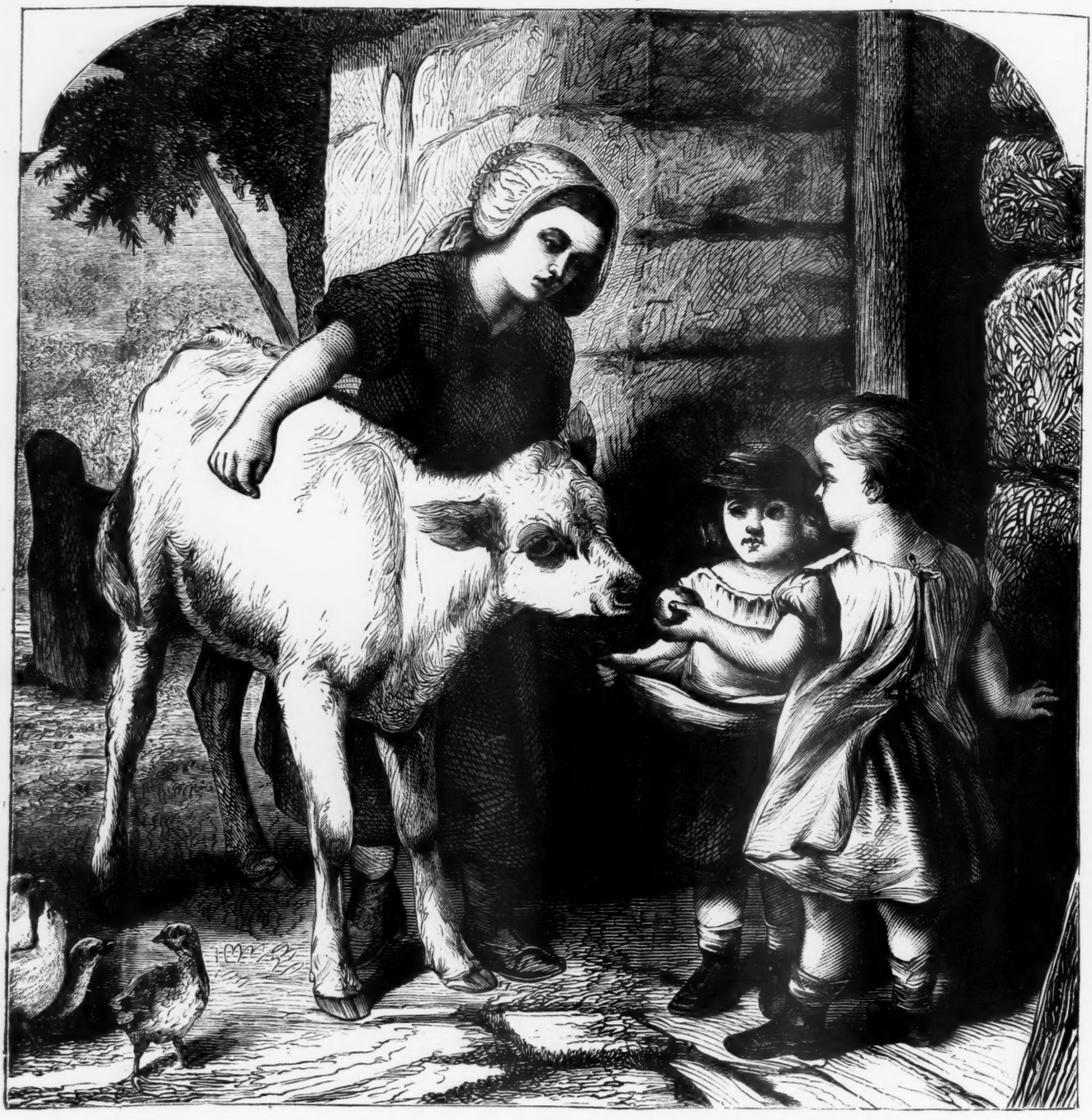


Fig. 2.—FLOWER AND FRUIT OF COFFEE (REAL SIZE).

an object of interest to those who, like our young friend, would like to know how coffee grows. Figure 2 gives a fruit, *b*, and the same at *c* cut open, showing the two seeds it contains. These seeds, *a*, are what we use as coffee, and in the trade are known as "coffee beans" and by the still more incorrect name of "coffee berries," for as we have seen they are not berries at all, but seeds. The fruits of the Coffee tree are gathered by hand and spread in the sun, and when the pulp is quite dry, they are run between rollers, to free the seeds from all adhering matters, after which they are passed



THE PET WHITE CALF AND ITS YOUNG FRIENDS.

through a sort of fanning mill to winnow them, when they are ready to be put into bags for market.

The Pet Calf.

No animal in the whole range of live stock upon the farm makes a finer pet for children than a young calf. It is not to be expected that all my young readers want a pet calf, and there are many who are not so situated that they can have one, however much they may desire it. But most of the boys and girls living on farms, where calves come and go every year, can have and I may add, ought to have, such a pet. A calf is naturally a very gentle animal, and in the hands of equally gentle children, it makes a pet that is loved even after its "calf-hood" has been out-grown. There is a great deal of comfort to a child in the feeling that the pet is its own; and the older readers may find in this fact a plea for the giving of young animals to their children to care for and bring up. I remember very well the first "little bossy" I had as my own (in name). It was just as red as a red calf can be, with the single exception of a small, white spot on the forehead. On this account I named the little creature "Spot," and that before she was a week old. "Spot's" mother was very affectionate to her new daughter, and did all she could to make the early life of the little calf a happy one. My attentions were misunderstood by the old cow, and I am not sure that she ever had perfect confidence in what I did for her little one. It was the custom with "our folks" to remove the calf from the cow after the third day, and "Spot" was no exception to the rule. When her time was up she was taken to a stall in the barn, and left there all to herself, while the mother bellowed and lowed in the distant yard for the little one that had been taken from her forever. No, not so long as that, but until "Spot" was no longer a calf, and all recollection of the real relationship between them had gone. "Spot" and I had great times together. That she had a will of her own was clear when I came to teach her to drink. At first she would rather go without her food than wet her nose in the pail of freshly drawn milk, but she soon came to love her "mess" as a hungry boy does a bowl of bread and milk. "Spot" grew up as one of the finest heifers in the county, with a coat as smooth and glossy as a new silk hat—made so by the rubbing and brushing that she received at my hands.

The engraving shows a calf of another color, and is the property of a thoughtful girl. The kind treatment which the calf has received from the little ones of the family has made it even more fearless than the children, and the greatest sympathy exists between them. There is more in having a pet and caring for it tenderly than one may at first sight think. It develops a part of the child's nature that is its best side. I wish every child could have some such living, loving thing to provide for, as it is one of the essentials, almost, to the proper growth of the child, making its after life easier, richer, and better. UNCLE HAL.

More Improvements—Enlargement of the Beatty Factory.

Increasing business has made necessary an enlargement of the Beatty Organ Factory at Washington, N. J., and the erection of a new foundry and machine shop, in order to meet the demand promptly. The main building is to be extended 100 feet, with an additional wing 80 feet long. A new engine of 150 horse-power will also be purchased. He has also bought 11 acres of land adjoining his factory for piling away lumber, residences for his workmen, etc. Mr. Beatty offers Parlor Organs at extremely low prices, and to any purchaser who will visit his factory, and select the instrument in person, he will deduct $5 from his advertised prices to pay their travelling expenses. He is only too glad to have intended purchasers visit his establishment. It is said that Mr. Beatty is very successful in his business, and that he is selling more instruments that are sold direct to the public than any other house. Mr. Beatty earnestly requests that intended purchasers visit him and see that the instruments he advertises so largely are just as he represents them. ☞ Read his NEW Advertisement.

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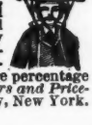

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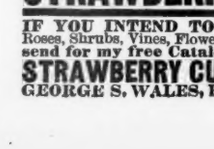

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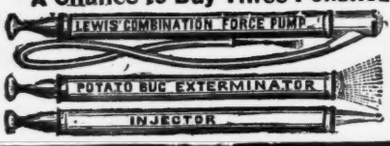

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Back numbers of the "American Agriculturist," containing articles referred to in the "Basket" or elsewhere, can always be supplied and sent post-paid for 15 cts. each, or $1.50 per volume.

The German Edition.—All the principal articles and engravings that appear in the *American Agriculturist* are reproduced in the German Edition. Besides these, there is a special department, edited by an eminent German cultivator. Our friends can do us a good service by calling the attention of their German neighbors and friends to the fact that they can have the paper in their own language, and those who employ Germans will find this Journal a most useful and acceptable present.

Bound Copies of volume 39, and of every previous volume back to Vol. XVI. (1857), neatly bound, with gilt backs, Index, etc., are supplied at $2 each (or $2.30 if to be sent by mail). See Publishers' Notes, 3d cover page.

Clubs can at any time be increased by remitting for each addition, the price paid by the original members; or a small club may be made a larger one at reduced rates, thus: One having sent 6 subscribers and $7, may afterwards send 4 names more and $3, making 10 subscribers for $10.00; and so for the various other club rates.

Terms to New South Wales, New Zealand, Australia, Africa, etc.—To several inquirers. Under the latest revision of the Postal Union Regulations the price of the *American Agriculturist* (either English or German edition), including postage *prepaid* through, will be covered by 7 shillings sterling per annum. This applies to the above countries, and to all others embraced in the General Postal Union. The simplest mode of remittance is by Postal Money Orders, payable in London, to the order of Orange Judd Company. These can be readily cashed in N. Y. City at a slight discount, which the publishers will cheerfully pay. For Club rates (postage included), see our second cover page, and reckon 22 cents to the shilling sterling.

The Munroe and Jefferson Grapes, and Mr. Reuben Acker.—Last month we published what we fully believed to be the facts in regard to the offering of the above two grapes in quantities of 20,000. Our statements were based upon the representations of well known parties, that the varieties could not be genuine if offered by the thousand. Our only interest in this, and similar cases, is to guard the people against purchasing grapes under wrong names. Mr. Acker meets the case in a very fair and frank manner. He claims that the circular must have been sent "by some malicious person," and that he, at least, is acting in good faith, and on the assurance of the raisers that the grapes are true to name. Mr. Acker's neighbors write us that he would not be willingly concerned in any misrepresentation. There is evidently a mistake somewhere, and until it can be shown where it lies, it is only just to Mr. Acker to say that he believes he has acted in good faith. It is therefore proper to assume that he has not knowingly sold a grape under a name that did not belong to it.

The American Veterinary College.—The Sixth Annual Commencement of this Institution, which took place in February last, was of a character to give great encouragement to its friends. Twenty graduates received their degrees of Doctor of Veterinary Surgery, and five of these received the different prizes offered by the Trustees and others. We know of no other profession that offers a more attractive field to a young man of the right qualifications and tastes, than that of Veterinary Surgeon, and of no other place to whom we should sooner direct a young man to go for his education in this profession than the American Veterinary College. The circular of the College can be obtained from Dr. A. Liautard, Dean of the Faculty, 141 West 54th St.

2 Months.

The General Premium Articles and Books are **open to all,** until July 1st. So there are

Two Months More,

for *filling out* premium lists of subscriptions already begun. ALSO for any one to begin and complete *new* premium lists. Those who have aimed at getting some larger premium and have not succeeded, may still do so; or if without any hope of success, may select some smaller article and fill up the list large enough to get that one. The Illustrated Descriptive List of the General Premiums (32 pages) will be mailed free to any one requesting it by postal card, and giving his address.

There is Plenty of Time yet, both to fill out lists, and to make up large and small new lists. Last year, and in previous years, *many* persons have begun in May and secured *without expense*, just the implements and other articles they needed, and thus saved an outlay of $5, $10, $20, $50, and sometimes a $100, and upward. LADIES have usually been most successful in May and June.

Over Thirty Thousand People have already received our Premium Articles **free of cost.** Let the reader be one of the constantly increasing number. A little effort *now* will secure just what is wanted, the present season. There are everywhere plenty of people who are not yet reading such a journal as this, who could do so with pleasure and *profit*.

Some of the Newer Potatoes.

Whoever keeps the run of the catalogues is aware that the growers of new varieties of potatoes have by no means given up their attempts to produce better varieties than any we now have. The "Early Rose" marked a great improvement in potato culture, and it is noticeable that to this day it is the standard with which all early varieties are compared, as the "Peach Blow" for late sorts. Among the several new varieties recently offered for the first time, two have been sent us for trial; the "White Elephant" and the "Belle."

The "White Elephant" we first saw last year at the store of Messrs. J. M. Thorburn & Co., who

"THE BELLE" POTATO.

had not then concluded to send it out. The uniform large size of the tuber was most striking, and the accounts showed an enormous yield. It was produced from that parent of so many fine potatoes, the "Garnet Chili," said to be fertilized with "White Peach Blow." Some of the specimens were given us for trial, and were found to be of excellent quality. We shall be disappointed if the "White Elephant" potato does not take rank with our very best late kinds.

Another novelty is "The Belle," which is well named, for half a dozen handsomer tubers are rarely seen than those which came in a box from Isaac F. Tillinghast, La Plume, Pa. Nothing definite seems to be known of the parentage of "The Belle," the originator, in New York State, not caring to have his success in producing new varieties known beyond his immediate neighborhood. Mr. Tillinghast thinks that this combines more of the requirements of a first-class potato than any other he has ever seen, and his experience covers the testing of several hundreds. The engraving, of about half size, shows the shape, which, as well as the size, is very uniform; the skin is light red, slightly russeted; eyes but slightly depressed. The yield is large; season medium. The potato upon the table is unsurpassed in quality, though the trial which we made was with specimens upon which the young sprouts had grown an inch or more in length.

The Peach Crop for 1881.—The peach growers in all parts of the country are filled with anxiety about their orchards. A few days ago a quantity of twigs were sent us by Hon. J. J. Rosa, Milford, Delaware, and have been submitted to a microscopic examination. The twigs were from seven leading varieties. The following is the detailed statement of the results obtained:

Variety.	*Flower Buds.*		*Lateral Stem Buds*		*Terminal Buds.*	
	dead	*alive*	*dead*	*alive*	*dead*	*alive*
Early Beatrice	65	none	10	none	5	none
Old Mixon	97	none	.....	.....	1	16
Crawford Late	107	none	5	4	7	4
Early Alexander	52	none	.....	.....	6	none
Reeves Favorite	63	none	7	5	6	5
Smock	30	none	10	none	none	4
Troth's Early	78	none	1	14	1	2
Total	492	none	33	23	26	31

It would appear from this examination that not only have the fruit buds been killed, but the twigs and stem buds have suffered badly. In most cases the wood, that should appear fresh with the inner bark green, is discolored and evidently dead. The bark on some of the twigs is wrinkled. There is reason to believe that there may be a sad truth in the statement recently made by a Delaware peach grower when he said: "We will probably not have another crop like the one of 1880 until new orchards are planted and come into bearing." The orchardists of Michigan and some other peach regions are more hopeful of a fair crop the coming season.

Albuminoids and Milk.—Milk, as it is natural to suppose from its functions, is a complete and therefore a complex food. Ordinary cow's milk contains about equal amounts of *albuminoi ls* or substances containing nitrogen, largely in the form of casein, and *fat*, or, when separated from all the other constituents, what is known as butter. The amount of these two most important substances is about 3.5 per cent of the whole milk, but is subject to considerable variation depending upon the breed of the animal and the food upon which it lives. In butter making we separate and sell a product which does not contain any albuminoids. In butter farming it therefore might be inferred that only carbonaceous foods were of importance, or at least by increasing the amount of carbohydrates fed, the cows would produce a corresponding increase in fat, or butter, in the milk given. After a long series of experiments made in Germany, supplemented by others in France and England, it is found that no such relation exists, and an increase of the carbohydrates *alone* is not followed by a corresponding increase of the butter. On the other hand there is found to be a close relation between the amount of nitrogenous food and the flow of milk, with a considerable change in its richness both in fat and albuminoids. These facts lead to the conclusion that we must look well to the supply of nitrogenous food of cows and, of course, along with it an abundance of carbohydrates. But the latter will not do alone, even though the product for which the cows are kept is a pure carbohydrate.

The Farmer's Model Horse.—With upwards of six million horses upon the farms of the United States, and prospects of the number doubling in a few years to come, the question of what is the best horse for the farmer is a very important one. The horse is an essential feature of the farm, and the companion and pet of the farmer; it is for use and should also be "a thing of beauty." The farm horse, like the farmer, in a certain sense, ought to be "a jack at all trades." It should be good for heavy loads, and at the same time find itself at home before the buggy upon the road; its disposition should be so kind and gentle, that the "women folks" can handle and use it with safety; of good size, with handsome frame, and a pleasing color. But how is such a horse to be obtained? Having a clear idea of what the farmer's horse should be, the horse raiser must breed for it. Good things do not come by chance, at least they do not come so regularly. By proper selection, the right animal, in time, will be produced. Every point mentioned above should be looked to, namely, size, strength, disposition, style, and color—and in bringing them out only the best material should be used. It is poor economy to breed only from old, broken down and diseased mares, that are good for nothing else. It costs no more to raise a colt that will grow into a large, handsome horse—one that will always bring a good price—than one that is small, ugly, and ill-shaped—in the long run it costs much less, and gives infinitely greater satisfaction. There is a great field in America for those who will *breed for* the farmer's model horse.

The Granite Iron Ware was put into our Premium List, because we were well convinced of its utility, and some of our associates, who are using it, strongly commend it.

Paper and Harvesters.—The Catalogue of the Champion Machine Co. gives an interesting history of the invention of their harvesting machines, and the remarkable expansion of their manufacture, from small beginning. In the surprising array of figures we notice the use of **106** *tons* of printing paper for Directions for Use, Pamphlets, Circulars, etc.

Working in the Sun, if very hot, is always uncomfortable, and sometimes dangerous. Ray's Sun Shade, so fastened as to shield the head, and yet leave the hands free, must be a decided comfort, often a health saver.

"Hybrid" Cotton Plants, of which seeds are being offered at the South, at 30 cents each, and of which $15,000 worth are claimed to have been sold this year, is just one of those preposterous things we have so often advised our readers to let alone. We have not room for further particulars now.

"The Farmer's Watch."—While a watch may be bought for $3 or $4, it is not likely to be of any real use. We have good reason, however, to believe the low-priced "Farmer's Watch," offered by Messrs. J. S. Birch & Co. will perform quite as satisfactorily as many that cost several times as much.

The Cooley Creamery, made by the Vermont Farm Machine Co., was used by P. G. Henderson, of Central City, Iowa, in making the "largest yield of Butter" reported at the recent meeting of the North Western Butter and Cheese Association, held at Cedar Rapids, Ia. This comparatively new method has many advantages over the old ones.

Ellwanger & Barry's Rose Catalogue is really a compact treatise on the Rose, and bears evidence of much careful research, as not only are the varieties described, but the name of the originator and the year in which each was first sent out.

Catalogues Received.

Many of the catalogues came just after the April number went to press, hence the apparent delay in noticing. Several are now crowded over for want of room.

SEEDSMEN.

BAGG & BATCHELDER, Springfield, Mass.—Besides seeds of all kinds, a full illustrated list of farm and garden implements, etc.

D. C. BRAINERD, Mount Lebanon, N. Y.—Sends the Shaker's annual catalogue of vegetable and flower seeds.

SAMUEL N. COX, Saint Joseph, Mo.—A very compact and useful list of vegetable and farm seeds.

J. C. EVERITT, Ontario, Ind.—Special Potato Circular, with some not known to Eastern growers.

JOSEPH HARRIS, Moreton Farm, Rochester, N. Y.—Much larger than heretofore, with various specialties.

AARON LOW, Essex, Mass.—A number of specialties in vegetables. Also farm and garden implements.

FRANK S. PLATT, New Haven, Conn.—A very full illustrated list of garden requisites, as well as seeds.

STEELE BROS. & CO., Toronto, Ont.—Besides flower, vegetable, and farm seeds, has implements, etc.

ISAAC F. TILLINGHAST, La Plume, Pa.—Offers "reliable seeds at honest prices," various new potatoes, and gives much useful instruction.

ROBERT VEITCH & SONS, New Haven, Conn.—Various novelties besides the standard seeds, with a compact but very full list of greenhouse and other plants.

FLORISTS.

PAUL BUTZ & SONS, New Castle, Pa.—Besides the general collection, a long list of novelties. Also a wholesale catalogue.

HENRY A. DREER, 714 Chestnut Street, Philadelphia.—The plant catalogue is appended to that of seeds, and is remarkably full, including many novelties.

EDWARD GILLETT, Southwick, Mass.—Offers North American plants in great variety, shrubs, ferns, etc.

W. A. HARKETT, Dubuque, Iowa.—A full list, including several varieties now sent out for the first time.

JOSEPH TAILBY, Wellesley, Mass.—A special list of his new Hybrid Carnations.

W. B. WOODRUFF, Westfield, N. J.—Bedding and other flowers and vegetable plants.

NURSERIES AND SMALL FRUITS.

C. H. ALLEN, Carbondale, Ill.—Small fruits in general, wholesale list.

H. S. ANDERSON, Union Springs, N. Y.—A descriptive and wholesale list of general nursery stock; and special circular of the Duchess, a new white grape.

FRANCIS C. BIDDLE, Chad's Ford, Dela. Co., Pa.—A neat and compact list of a full stock in all departments.

BUSH & SON & MEISSNER, Bushberg, Jefferson Co., Mo.—Besides the regular catalogue arranged as usual, a list of many novelties classified according to origin.

JOSEPH D. FITTS, Providence, R. I.—A special descriptive list of strawberries, old and new.

GALLAGHER & GAUTHIER, Beaconsfield, P. Quebec, also Montreal.—Grapes and other small fruits with useful directions for cultivation.

THOS. JACKSON, Portland, Me.—Fruit and ornamental trees, including evergreens, old and young.

P. F. JEFFREY & BRO., Hempsted (L. I.) N.Y.—General nursery stock and vegetable plants.

W. W. JOHNSON, Snow Flake, Antrim Co., Mich.—Small fruits and tree seedlings, including evergreens.

J. W. MANNING, Reading, Mass.—Lists of specialties supplementary to the general catalogue.

PARSONS & SONS COMPANY, Flushing, N. Y.—An exceedingly neat catalogue of one of the most remarkable collections of ornamental trees, etc., to be found in this or any other country, also a fruit list.

JAMES H. RICKETTS, Newburgh, N. Y.—Descriptions of several of his remarkable seedlings now offered, with illustrations; also peaches, strawberries, etc.

F. WALKER & Co., New Albany, Ind.—General fruit and ornamental stock.

J. B. WILD & BROS, Sarcoxie, Jasper Co., Mo.—General list of fruits, with some new and rare kinds, also ornamental trees, greenhouse plants, etc.

LIVE STOCK.

JOHN A. COLE, Hurtisford, Wis., and JEWELL & COLE, Milton, Mo., issue jointly a catalogue of Poland China and Suffolk Swine, with pedigrees of breeding stock.

E. W. DAVIS, Oneida, N. Y.—Breeder of improved Cheshire swine.

J. F. SHAFFER, Macungie, Lehigh Co., Pa.—High class poultry, including White Holland Turkeys.

IMPLEMENTS AND MACHINERY, ETC.

W. D. ANDREWS & BRO., 229 Broadway, N. Y.—History of and legal decisions as to the American Driven Well.

BELCHER & TAYLOR, Chicopee Falls, Mass. A great variety of implements for general and special culture, with abundant illustrations.

A. & F. BROWN, Nos. 57-61 Lewis St., N. Y. City. Shafting, pulleys, and other machinery in great variety.

J. T. BUDD, Wilmington, Del.—An illustrated account of "Garden and Farm Lands of the Peninsula."

JAS. A. CAMPBELL, Harrison, Ohio.—Campbell's Corn and Seed Drills with Hilling Attachment.

JOHN S. CARTER, Syracuse, N. Y.—An illustrated list of machinery, etc., used in cheese and butter factories.

CHAMPION MACHINE CO., Springfield, Ohio.—A history and description of the Champion Mowing and Harvesting Machines, which are now made by six immense factories, in the U. S. and Canada.

LEWIS MANUFACTURING WORKS, Catskill, N.Y.—Lewis' Agricultural Syringe and his Combination Fire Extinguisher, are fully described and illustrated.

THE MASS. ARMS CO., Chicopee Falls, Mass., describe the Maynard Breech-Loading Fire Arms in a neat illustrated pamphlet.

OLIVER FOSTER, Mt. Vernon, Linn Co., Iowa.—Bees and apiarian requisites; comb-foundation and machine.

TIMOTHY B. HUSSEY, North Berwick, Me.—Illustrates and describes his plows, harrows, cultivators, etc.

JAMES LEFFEL & Co., Springfield, Ohio.—A handsome catalogue showing the Bookwalter Engine and James Leffel's Improved Double Turbine Water Wheel.

MANNY & BAUER M'F'G. Co., St. Louis, Mo., handsomely illustrate and describe their sugar machinery.

NORDYKE & MARMON Co., Indianapolis, Ind.—This is more than a catalogue; it is a treatise on Flour Mill Machinery—a wonder in the way of copious illustration.

L. C. ROOT & BRO., Mohawk, N. Y.—Bees and Bee-keeping supplies of every kind.

E. W. ROSS & Co., Fulton, N. Y.—Ensilage cutters of various sizes for different powers.

F. S. WILLSON, Columbus, O.—Illustrated description of Willson's Spring Single-Tree.

POULTRY DEALERS.

T. B. DORSEY, Anderson P. O., Md.—Choice fowls of various breeds.

DR. MAYER, Willow St. P.O., Lancaster Co., Pa.—Light Brahmas and a condensed treatise on keeping them.

H. H. STODDARD, Hartford Conn.—Poultry Bit to prevent feather eating, and various other appliance.

Important Notice
TO
ADVERTISERS,
Contributors and Correspondents.

The immense Edition of the *American Agriculturist* requires it to be sent to press at even a still earlier date than hitherto.

To secure insertion in JUNE, Advertisements must be in hand prior to May 5th, and all matter belonging to the Reading Columns before May 2d.

Great Opportunities
FOR
BARGAINS IN FARMS.

Very Valuable Farm Lands For Sale in Colfax and Madison Counties, Nebraska. These lands, or a portion of them, will be exchanged for farm lands that are free and clear, in the neighborhood of New York City. These lands offer a most excellent opportunity to persons going west. They are among the most valuable in Nebraska and will be sold at very reasonable rates. Also for sale or exchange a dairy farm of 100 acres, all stocked, in Orange County, New York. For full particulars address **G. W. FISH,** Box M., Station D., N. Y. City Post Office.

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I will send good blocks of the celebrated Minnesota Pipe Stone, post paid, for 25 cts. each, or 5 for $1. With a sharp knife this stone can be carved into books, rings, charms, and other beautiful ornaments, by persons of ordinary ingenuity. I will send splendid paper weights, made of the best quality of this stone, prepaid and registered for $1 each. 3 ct. stamps taken for less amounts than $1. Address **GILES FARMIN,** Little Rock, Nobles Co., Minnesota.

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GRIND YOUR BONE-MEAL. CRUSH your own oyster shells in the $5 HAND MILL. Will crush a peck in 13 minutes. Illustrated circulars and testimonials furnished. **FRANK WILSON,** 44 Delaware St., EASTON, Pa.

25 VERBENAS FOR $1.00.

12 Coleus for $1.00. 10 Tuberoses for $1.00. Send for catalogue of Novelties in Greenhouse and Bedding Plants, Bulbs, Ferns, etc. **E. S. MILLER, Wading River, N. Y.** Name paper.

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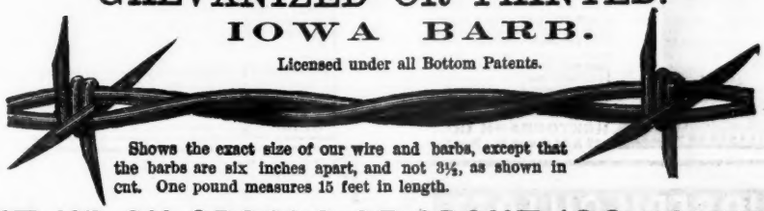

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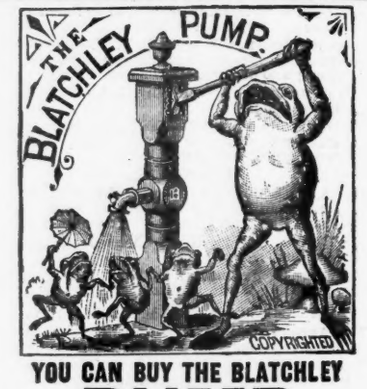

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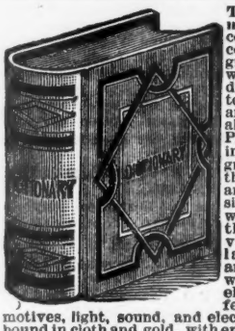

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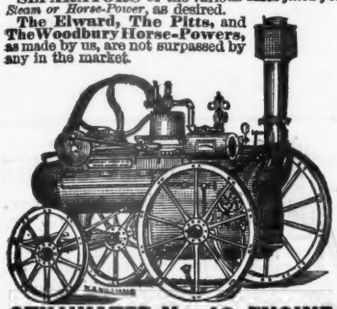

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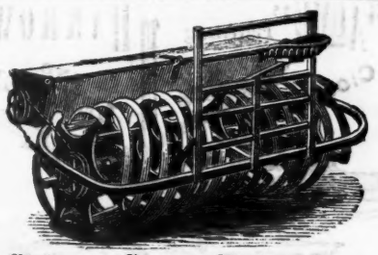

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Vibrating Threshers
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Better than any others in the market.

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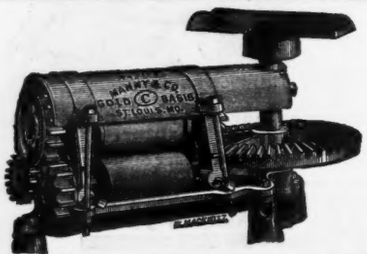

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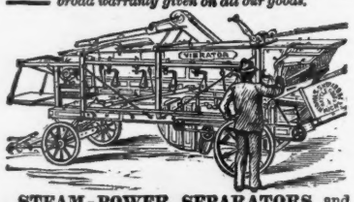
Most Complete Thresher Factory in the World. } **Established 1848**

32 YEARS *of continuous and successful business,* management, or location, *to "back up" the broad warranty given on all our goods.*



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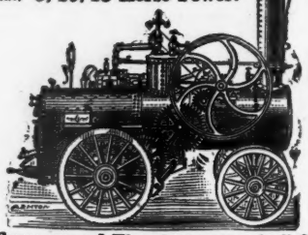

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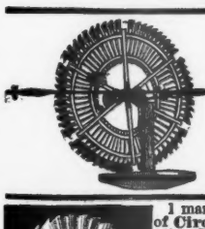

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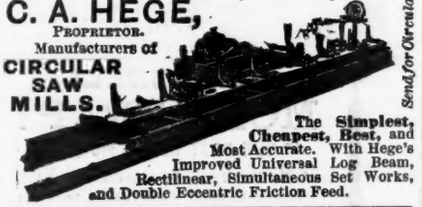

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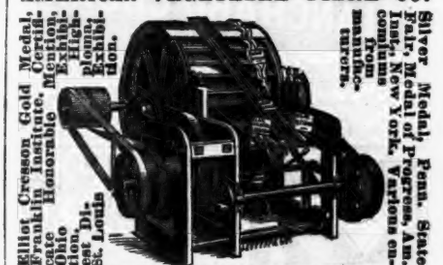

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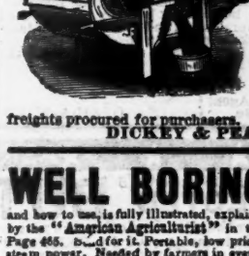

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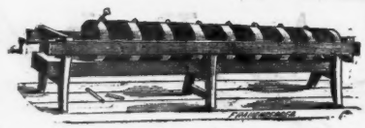

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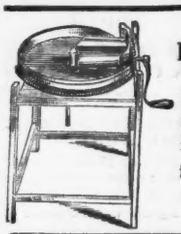

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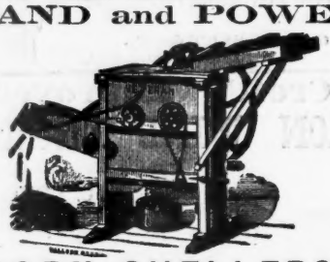

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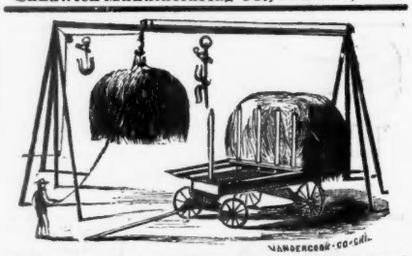

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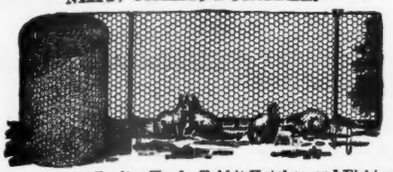

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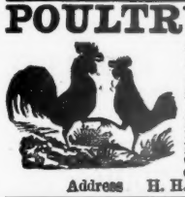

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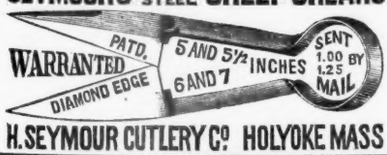

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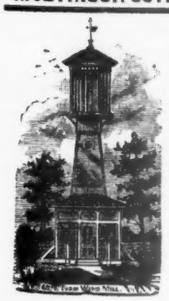

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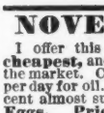

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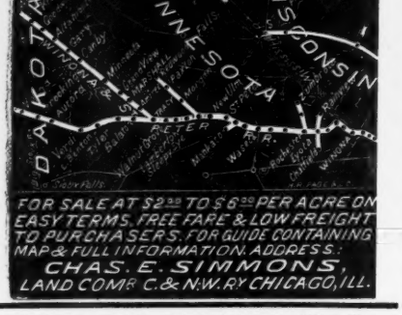
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